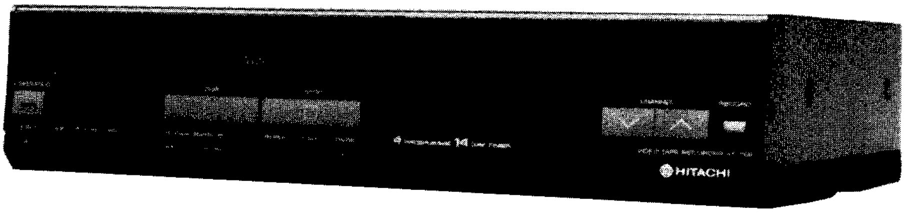
HITACHI
• SERVICE MANUAL

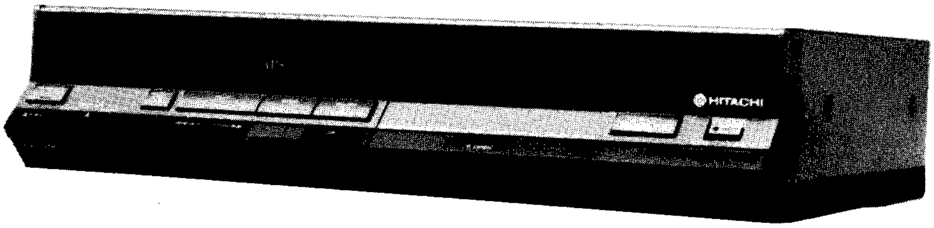
TK | No. 2397E

VT-110E/120E(CT)

Technical Data



— VT-110E —



— VT-120E —

MC-Service

VHS
THIS VIDEO DECK IS A VHS TYPE VIDEO RECORDER.
FOR PROPER OPERATION, ONLY THE VHS TYPE CASSETTE MUST BE USED.

Differences between VT-110E and VT-120E

ITEM \ MODEL	VT-110E	VT-120E
SHAPE OF FRONT PANEL	STRAIGHT FACE	SEMI-SLANT FACE
OPERATING SOUND	——	Pi-SOUND

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

VIDEO CASSETTE RECORDER

February 1986 **TOKAI WORKS**

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CHAPTER 1

SPECIFICATIONS

ITEM	VT-110E/120E
Format:	VHS PAL Standard
Recording:	Rotary Two-Head Helical Scan Azimuth Recording
Tape Speed:	23.39 mm/sec.
Tape Width:	12.7 mm
Operation Temperature:	5°C to 40°C
Video:	PAL colour (system B & G) & CCIR monochrome signals 625 lines
Recording Time:	240 min. (with Hitachi E-240 cassette)
Aerial Input:	VHF channels 2 — 12 CATV channels S1 — S20 UHF channels 21 — 69
RF Output:	UHF channels 37 (30 — 39 adjustable) (System G)
Video Input:	0.5 to 1.5V p-p 75 ohm Unbalanced
Video Output:	1V p-p 75 ohm Unbalanced
S/N Ratio (Video):	40 dB
S/N Ratio (Audio):	43 dB
Horizontal Resolution:	Colour 240 lines
Audio Input:	−2 dBm 50 Kohm
Audio Output:	−2 dBm 10 Kohm
Audio Frequency Range:	70 Hz to 12 kHz
Power:	AC 220V 50 Hz
Power Consumption:	34W (including timer)
Timer:	24 hour digital indication
Cabinet Size:	435 mm(W) x 95 mm(H) x 324 mm(D)
Weight:	7.0 kg
Accessory Included:	1 — Aerial cable 2 — Programme sheets 1 — Infrared Remote control unit

* Design and specifications are subject to change without notice.

SAFETY PRECAUTIONS

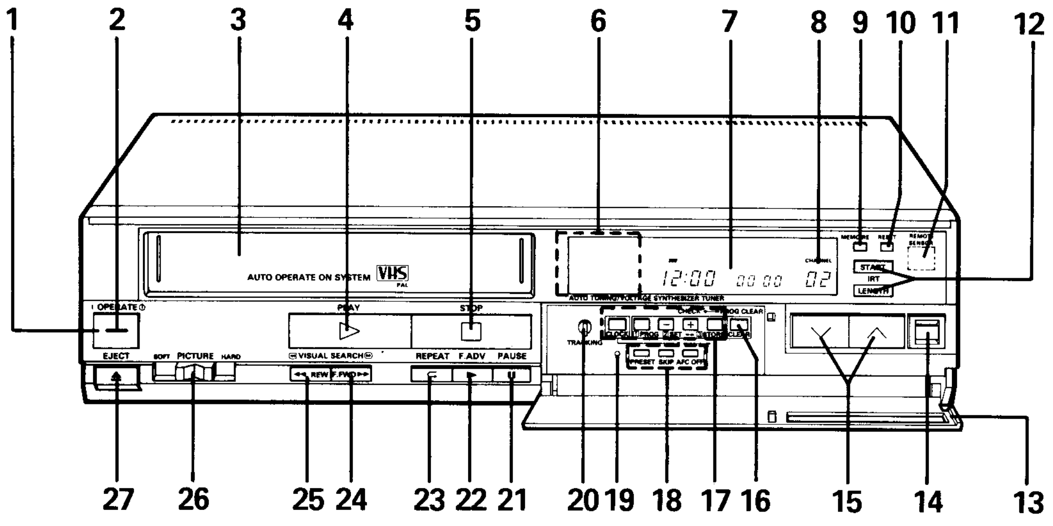
The following precautions should be observed when servicing.

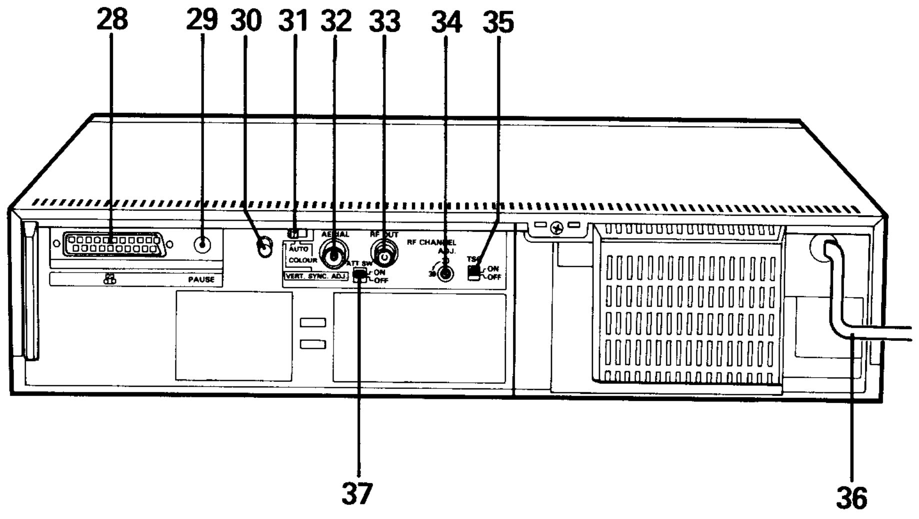
1. Since many parts in the unit have special safety-related characteristics, always use genuine Hitachi replacement parts. Especially critical parts in the power circuit block should not be replaced with other makers'.
   Critical parts are marked with ⚠ in the schematic diagram and circuit board diagram.
2. Before returning repaired unit to the customer, the service technician must thoroughly test the unit to ascertain that it is completely safe to operate without danger of electrical shock.

LIST OF DIFFERENCES

	ITEM		VT-110E/120E	VT-63E
FEATURES	HQ (HIGH QUALITY)		USED	UNUSED
	TRICK PLAY		○ VISUAL SEARCH ○ PAUSE ○ F. ADV (By Remote Control) ○ REPEAT	○ VISUAL SEARCH ○ PAUSE
	AUTO OPERATE ON FUNCTION		YES	NO
	NOISE LOCK SEARCH FUNCTION		YES	YES
	REMOTE CONTROL		WIRELESS	WIRED
	TIMER RECORDING PROGRAMS		4 PROGRAMMES/2 WEEKS	4 PROGRAMMES/2 WEEKS
	TIMER BACKUP POWER		ABOUT 5 MINUTES	ABOUT 5 MINUTES
	TIMER PROGRAMMED TIME DISPLAY		START AND STOP SIMULTANEOUSLY	START AND STOP SEQUENTIALLY
	IRT		CAN SET START TIME	CAN SET RECORDING TIME ONLY
	TAPE COUNTER INDICATOR		INDEPENDENT	CLOCK/COUNTER SWITCHING
	MEMORY STOP OPERATION MODE		REWIND AND FORWARD	REWIND
	CHANNEL TUNING FUNCTION		VOLTAGE SYNTHESIZER (AUTO TUNING)	VOLTAGE SYNTHESIZER
	INPUT SELECT SWITCH		NONE	YES
	PLAYBACK PICTURE CONTROL		HIGH FREQUENCY CONTROL	HIGH FREQUENCY CONTROL
	ONE BUTTON RECORDING		YES	NO
CHASSIS	BASIC CHASSIS TYPE		UY	UX
	CYLINDER MOTOR		THREE-PHASE OUTER ROTOR FG: 300 Hz	SINGLE-PHASE FLAT FG: 200 Hz
	VIDEO HEAD		2 HEADS CH-1/CH-2: 65 μm CONNECTOR TYPE	2 HEADS CH-1/CH-2: 65 μm SOLDERED TYPE
	HEATER		NONE (USED HEAT SINK)	YES
	DEW SENSOR		NO	NO
MAIN CONTROL ICs	VIDEO SYSTEM	Y-SIGNAL PROCESS CHROMA SIGNAL PROCESS REC/PB AMP AND CORRECTOR PICTURE CONTROL	HT4727 (IC203) HT4539 (IC301) HT4708 (IC205) HA11852 (IC1) MSM6965RS (IC204)	HT4238 (IC202) HT4239 (IC203) HT4207 (IC201) —— ——
	AUDIO SYSTEM	REC/PB AMP	BA5115L (IC402)	BA5115L (IC402)
	SERVO SYSTEM	SPEED/PHASE CONTROL CYLINDER MOTOR DRIVE CAPSTAN MOTOR DRIVE TRICK PLAY CONTROL	M54898P (IC601) HA13403 (IC1651) M54648L-B (IC602) ——	HA11843 (IC604) HA13430A (IC601) M54548L-A (IC603) ——
	SYSTEM CONTROL	SYSTEM CONTROL μP LOADING MOTOR DRIVE	HD614042SD37 (IC901) M54649L (IC902)	HD38820L26 (IC901) M54549L (IC902)
	TIMER	TIMER μP	HD614045SD53 (IC751)	M50757-681SP (IC101)
	CH-TUNING SYSTEM	TUNING μP BAND SWITCHING	M50161-354SP (IC801) LA7934 (IC802)	M50161-056SP (IC701) LA7910 (IC703)
	POWER SUPPLY	REGULATOR	STK5471 (IC851)	STK5451 (IC151)

CONTROLS AND FUNCTIONS — VT-110E —





1. **OPERATE SWITCH**
Turn system power on and off.

2. **OPERATE INDICATOR**

3. **CASSETTE COMPARTMENT**
Insert a cassette in through the door, and loading will be completed automatically.
Note: Power is turned on automatically when the cassette is loaded.

4. **PLAY BUTTON**

5. **STOP BUTTON**
The STOP button must be pressed between "RECORD" and any other operation.

6. **MODE INDICATORS**
   - " ▭ " appears when a cassette is in the compartment.
   - "PLAY" appears during the playback mode.
   - " REC " appears during the record mode.
   - "◄◄" appears during the rewind mode and flashes during rewind visual search mode.
   - "►►" appears during the fast forward mode and flashes during forward visual search mode.
   - " ❚❚ " appears during the play/record pause mode.
   - " 🕒 " appears when turning the power off after programming the timer.

7. **DIGITAL DISPLAY**
This shows the time with a 24-hour display and shows the tape position.

8. **CHANNEL INDICATOR DISPLAY**
This shows the channel number corresponding to the channel selected.

9. **MEMORY BUTTON**
Press this button so "M" is indicated in the display, then fast forward or rewind the tape. The tape stops when the counter reaches approximately "0000".
Note: Press the button again to switch off the "M" indicator.

10. **COUNTER RESET BUTTON**
To reset counter to "0000".

11. **INFRARED RAY RECEIVING SECTION**
Receives infrared rays from remote control unit.

12. **INSTANT RECORDING TIMER BUTTONS (IRT)**
This allows unattended recording.
Timer will switch the VTR off automatically at a preselected time. This is convenient when you go out during recording.

13. **SECONDARY CONTROL DOOR**

14. **RECORD BUTTON**
Press RECORD button to record.

15. **CHANNEL SELECT BUTTONS**
Select the channels you wish to view or record by pressing these buttons.
And you can also select the "AUX" position* by pressing this button to record or watch the programme input at the PERI jack.
* One channel position either higher or lower outside the range of your preset channels.

16. **PROGRAMME CLEAR BUTTON**
Press the button to clear the programming information.

17. **TIME SET BUTTONS**

18. **CHANNEL PRESET BUTTONS**

19. **TIMER RESET SWITCH**
Press this switch if the digital display malfunctions or no display appears to reset the display. Set the correct present time for the clock then programme the timer.

20. **TRACKING CONTROL**
To minimize noise in playback.

21. **PAUSE BUTTON**
Press to pause during recording.
Press to view a still picture during playback.
Press again to release.

22. **FRAME ADVANCE BUTTON**
When you hold FRAME ADVANCE button down during still playback mode, tape will be played back frame by frame. Operates only after PAUSE button has been pressed.

23. **REPEAT BUTTON**
Press this button after pressing the PLAY button to repeat the scene you have just viewed during playback. The tape is rewound to the position where PLAY button was pressed, then the tape is played back from that position.

24. **FAST FORWARD/VISUAL SEARCH BUTTON**
Press to activate fast forward.
Press this button during playback and forward playback picture at high speed can be seen.

25. **REWIND/VISUAL SEARCH BUTTON**
Press to start rewind.
Press this button during playback and reverse playback picture at high speed can be seen.

26. **PICTURE CONTROL**
Adjust the picture so it is easy to see.

27. **EJECT BUTTON**
Press to remove cassette. The STOP button must be pressed before "EJECT".

28. **PERI JACK**
For connection with a TV with a PERI or DIN jack using an exclusive cable.

29. **CAMERA PAUSE JACK**
Connect Camera pause cable.

30. **VERTICAL SYNC. ADJUSTMENT CONTROL**
If you see vertical shaking on the TV screen in the still playback mode, rotate this control to minimize shaking.

31. **AUTO/COLOUR SWITCH**
AUTO: Circuits are automatically switched to colour or black/white mode. Set to this position when playing or recording PAL signal.
COLOUR: When recording PAL signal in the area very far from broadcasting station, the recorded picture may lose colour. In this case set to this position in recording and playback.

32. **AERIAL INPUT SOCKET**
Connect external aerial.

33. **RF OUTPUT**
Connect to TV aerial input.

34. **RF CHANNEL CONTROL**
Turn TSG ON/OFF switch to "ON" and rotate this control to set the video channel correctly.

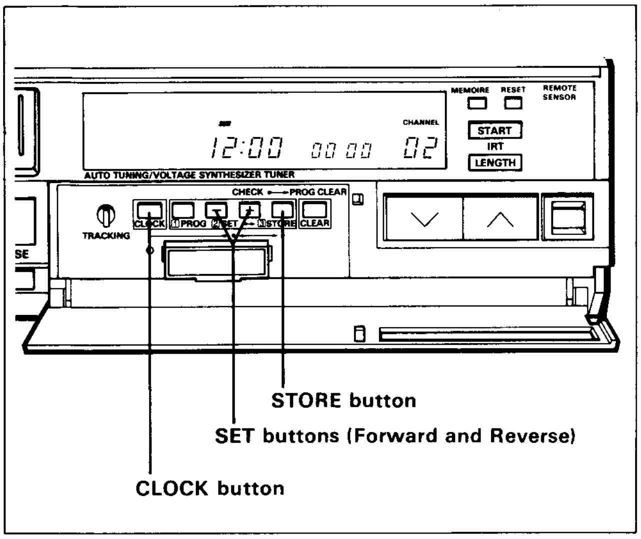
35. **TSG ON/OFF SWITCH**
Set to ON and check that the video channel of your TV set is correct. After setting, set this switch to OFF.

36. **MAINS LEAD**

37. **ATTENUATER SWITCH**
Generally set to the NORMAL position.
Set to "ATT-ON" when interference occurs in an area with a strong signal.

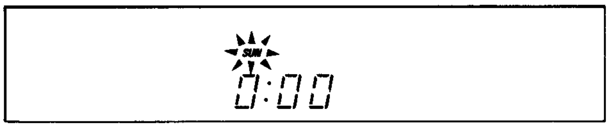
CLOCK TIME SETTING

The built-in digital clock is based on a 24 hour cycle and gives you a constant readout of the time and day.

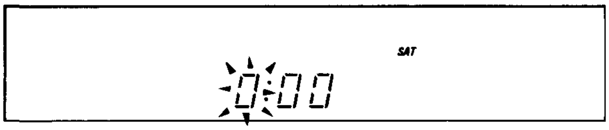

MEMOIRE
RESET
REMOTE SENSOR
CHANNEL
12:00 00 00 02
START
IRT
LENGTH
AUTO TUNING/VOLTAGE SYNTHESIZER TUNER
CHECK
PROG CLEAR
TRACKING
CLOCK
PROG
SET
STORE
CLEAR
STORE button
SET buttons (Forward and Reverse)
CLOCK button

- When the MAINS lead is plugged in for the first time, "– –:– –" will appear on the display.

1. Press the CLOCK button.
   "SUN" flashes on and off and "0:00" lights.

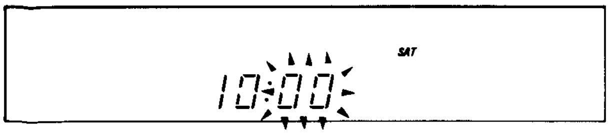


2. Press the SET button (Forward or Reverse) to select the present day of the week.
   Hold the button down to advance rapidly.
   When the present day of the week appears, press the STORE button. "0" hour starts flashing.



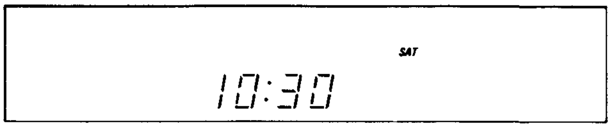
   For example, the above diagram shows that Saturday (SAT) has been set.

3. Press the SET button (Forward or Reverse) to set the present hour.
   Hold the button down to advance rapidly. Press the STORE button when the present hour appears.
   "00" minutes starts flashing.



   For example, the diagram shows that "10" hour has been set.

4. Press the SET button (Forward or Reverse) to set the minute.
   Hold the button down to advance rapidly. Press the STORE button when the present minute appears.



   For example, the diagram shows that "30" minutes has been set.

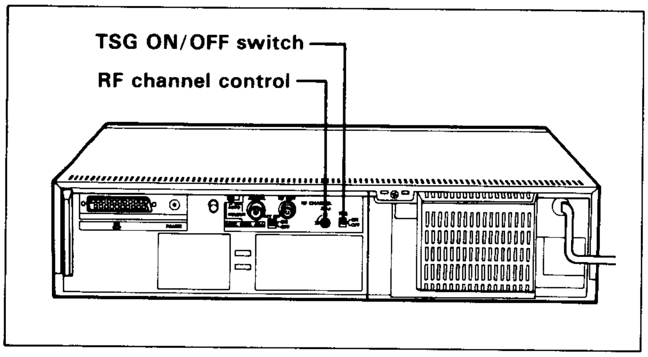
Now the clock has been set to the correct time of day.

Notes:

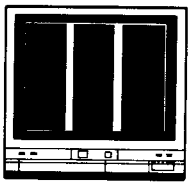
- This VTR has a built-in power failure compensation circuit. If power interruption of less than 5 minutes occurs, the clock time and programming will not be lost.
- The digital display is bright when the OPERATE switch is turned ON and automatically becomes dim when the switch is off.

VIDEO CHANNEL SETTING

The RF converter changes the video and audio signals from a previously recorded video tape during playback to the same type of signal used for TV broadcasts. The RF converter output in this unit is pre-set prior to shipment to UHF channel 37.


TSG ON/OFF switch
RF channel control

1. Turn the TV on and select an unused channel (CH37) (in some cases this may be marked A/V).
2. Turn the OPERATE switch on.
3. Set the TSG ON/OFF switch to "ON". Then tune the TV until the test pattern shown below is received.



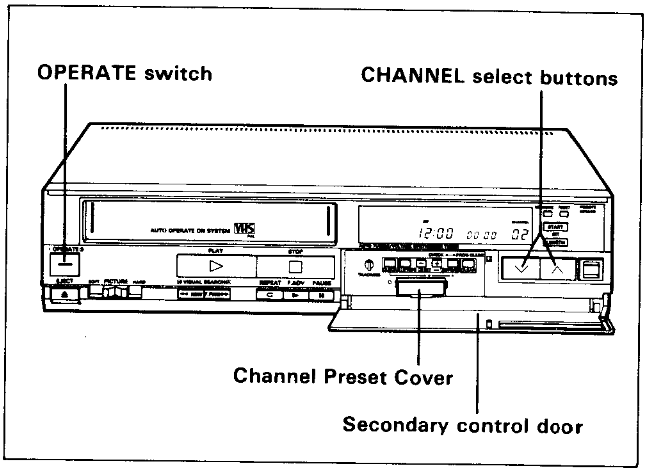
4. If it is not possible to correctly tune to the test pattern or channel 37 is used for broadcasting in your area, adjust the RF converter output with the RF channel control using a small screwdriver and re-adjust your TV until the test pattern is observed. For higher channel numbers, turn counterclockwise. For a lower channel, turn clockwise.
5. Having completed the adjustment, set the TSG ON/OFF switch to "OFF".

When connecting the VTR to a TV set provided with auto-tuning and the video channel cannot be set, operate as follows:

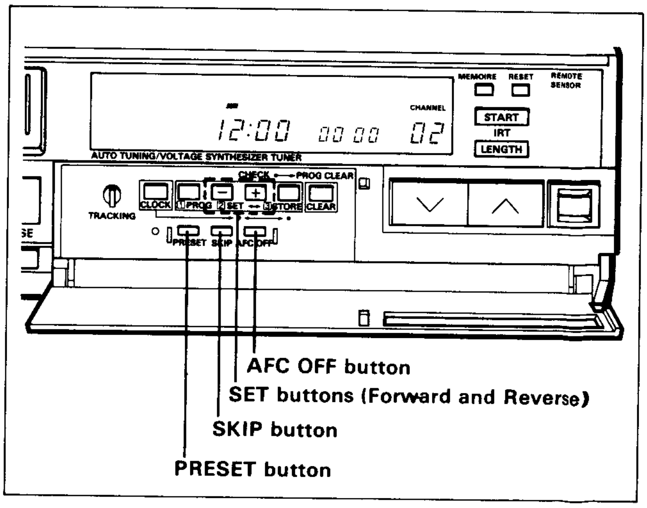
1. Remove the aerial cable from the AERIAL terminal on the VTR.
2. Leave the TSG ON/OFF switch "OFF".
3. Playback a blank tape.
4. Press the PAUSE button to obtain the pause mode.
5. Press the Auto-tuning button.
6. Auto-tuning starts and it stops at video channel 37.
   Note: The auto-tuning indicator of the TV set changes to an exact tuning indicator.
7. Set the channel memory of the TV to ON and store the channel which was set in item 6.
8. Set the TSG ON/OFF switch to "ON" and check that the picture appears on the TV screen.
   Now, the video channel of TV has been set properly.
9. Return the TSG ON/OFF switch to "OFF".
10. Reconnect the aerial cable to the VTR.

PRE-TUNING OF BUILT-IN TV TUNER

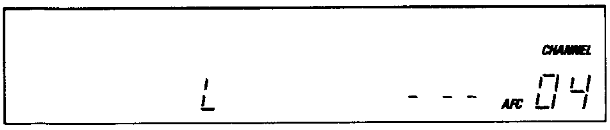
This VTR incorporates a complete television tuner with the required tuning controls. Once you have pre-tuned to preferred stations, you can select any of them by merely pressing the CHANNEL select button.


OPERATE switch
CHANNEL select buttons
Channel Preset Cover
Secondary control door

1. Turn the TV on and select the pre-tuned video channel.
2. Turn the OPERATE switch of the VTR on.
3. Open the Secondary control door to access the Pre-tuning controls.
4. Remove the Channel Preset Cover.

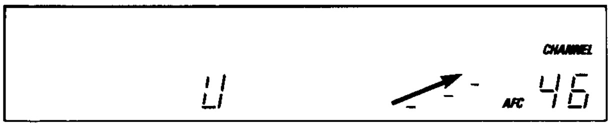

AUTO TUNING/VOLTAGE SYNTHESIZER TUNER
TRACKING
CLOCK
PROG
SET
STORE
CLEAR
PROG CLEAR
CHECK
START
IRT
LENGTH
AFC OFF button
SET buttons (Forward and Reverse)
SKIP button
PRESET button

5. Press the PRESET button once.
   The display indication changes from the clock time display to the band indicator display.
   Note: Pressing the button twice will lock the display. If you have pressed it twice, press it once more.
6. Press the CHANNEL select button on VTR to select the channel to be memorized.
   Notes:
   1. The Channel Number Display can be now consecutively selected from "00" through "73" and then "95" through "99" and "AUX" by pressing the CHANNEL select button either upward or downward. In this case, Channel Number may be any number.
   2. When "AFC" is not indicated in the display, press AFC OFF button to display "AFC".

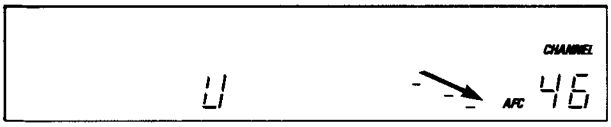


For example, the above diagram shows that channel 4 has been selected.

7. Press the SET button (Forward or Reverse) to start tuning.
   At a station that is broadcasting, the picture appears on the TV screen. If the station received is different from the channel to be preset, press SET button (Forward or Reverse) again.
   At the next station, the searching will stop and the new station can be preset. Repeat this until the desired station is reached. By repeating this, the Band indicator on the display will change in sequence L, H, U, L....
   Notes:
   - Press SET button (Forward); channels are searched in the order, VHF (1 – 12) → CATV (S1 – S20) → UHF (21 – 69), and "–" appears in sequence in the direction of the arrow during searching.



   - Press SET button (Reverse); channels are searched in the reverse order to the above, and "–" appears in sequence in the direction of the arrow.



8. Follow the same steps as explained in steps 6 and 7 above for other channels.
   You can preset up to 79 channels in memory.
9. After having completed tuning all channel memories you want, press the PRESET button once again.

These channels preset in memory as shown in the above can be selected by the CHANNEL select buttons on the VTR.

The provided sheet is used to list the programmes to which you pre-tune your VTR. List the programmes and paste the sheet on the side panel, etc. so as not to hinder you when you operate the VTR.

AFC (Automatic Frequency Control)

Since this unit has an AFC circuit, when a channel is preset following the above procedure, the AFC turns on automatically and you can receive the signal in optimum condition.

If a TV channel signal is marginal due to graininess or ghosting, the picture may sometimes be improved by manually tuning for best picture and then defeating the AFC action. To turn AFC off, follow the procedure below.

1. Select the desired channel by pressing CHANNEL select button.
2. Press the PRESET button once.
3. Press the AFC OFF button. "AFC" disappears from the display.
   Note: Pressing the button once again will turn the AFC on.
4. Press the PRESET button once again.

Channel selection

The channel up and down controls on the VTR permit advancing the tuner directly to the next higher or lower programmed channel.

Eliminating unwanted preset channels

You can rearrange the desired channels by eliminating unwanted preset channels for channel up/down tuning.

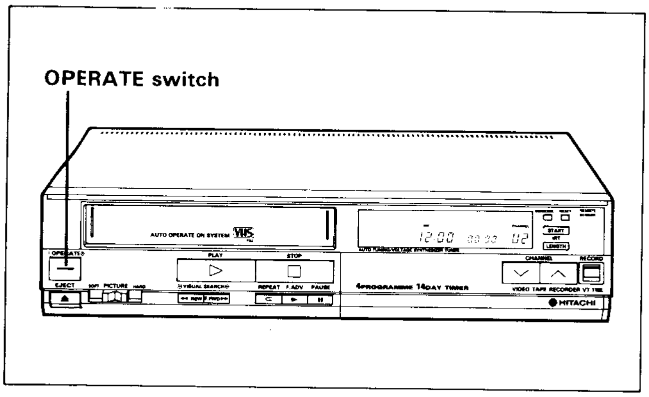
1. Press the PRESET button once.
2. Press the CHANNEL select buttons until an unwanted channel is found.
3. Press the SKIP button once.
   Sound will go off indicating the channel has been erased from memory.
4. Repeat steps 2 and 3 until all unwanted channels have been erased.
5. After eliminating them, press the PRESET button once again.

Note: To restore the erased channel, repeat the above steps 1 through 3.

TIMER RECORDING

The programmable electronic clock/timer permits the unattended recording of 4 preselected programmes within a period of 14 consecutive days, including the same programme(s) repeated on every day and the same programme(s) every week. It turns the unit on and off and selects the channel automatically.

Preparations for timer recording

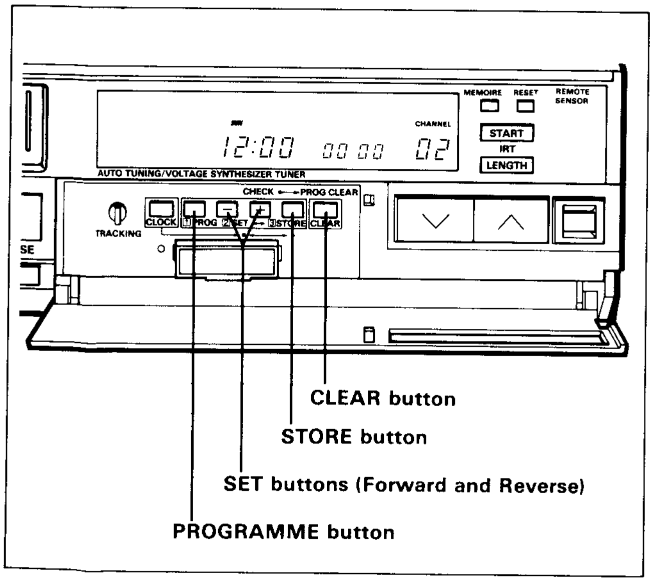

OPERATE switch
12:00 00 00 02
HITACHI

- Your TV does not have to be on to make a recording because the VTR records TV programmes without the aid of your TV. Its only use is for monitoring.

1. Make sure that the clock shows the present time and day correctly.
2. Insert a cassette.
   Be sure to check that the record safety tab is not missing. If the record safety tab is missing, recording will not begin.
3. Programme the timer.

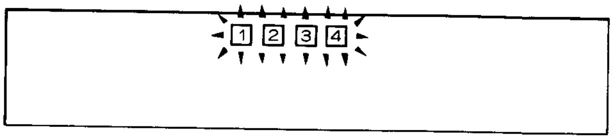
Programming the timer for unattended recording

For unattended recording the timer needs to know what **day** to make the recording, the **time to start**, the **time to stop**, and the **channel to be recorded**.


MEMOIRE
RESET
REMOTE SENSOR
CHANNEL
12:00 00 00 02
START
IRT
LENGTH
AUTO TUNING/VOLTAGE SYNTHESIZER TUNER
CHECK ←→PROG CLEAR
CLOCK
PROG
SET
STORE
CLEAR
TRACKING
CLEAR button
STORE button
SET buttons (Forward and Reverse)
PROGRAMME button

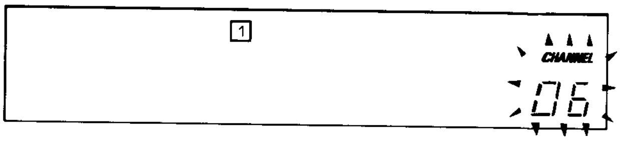
Note: If you input erroneous information by mistake when programming the timer, press the CLEAR button and input the correct information again.

1. Press the PROGRAMME button.
   Programme indicators (1 through 4) flash to indicate which memory positions have not been programmed. If a memory has been programmed, its indicator will not flash.



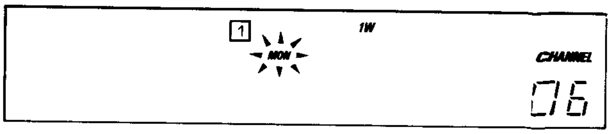
Note: You should determine which memory positions have not been programmed before entering new programming information. New information automatically erases previous programming.

2. Press the SET button (Forward) until the desired programme indicator lights. Programme indicators (1 through 4) light, in sequence, across top of digital display. Press the STORE button when the desired programme number is displayed. Channel number starts flashing.

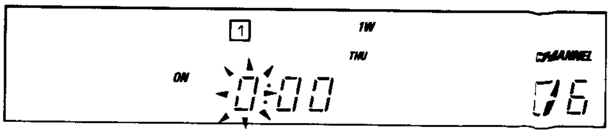

1
CHANNEL
06

For example, above diagram shows programme "1" has been set.

3. Choose the channel to be recorded by pressing the SET or CHANNEL select button. Then press the STORE button.
   "1W" appears and the present day flashes.


1
MON
1W
CHANNEL
06

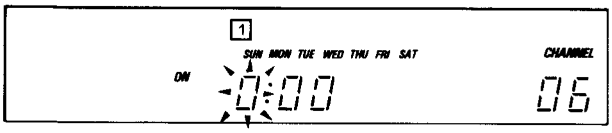
4. Press the SET button (Forward or Reverse) to select the day of recording. Make sure desired Week indicator (1W or 2W) lights. Continuing forward will advance timer to Week Two.
   Press the STORE button after selecting the day of recording. "0" hour starts flashing.


1
1W
THU
ON
0:00
CHANNEL
06

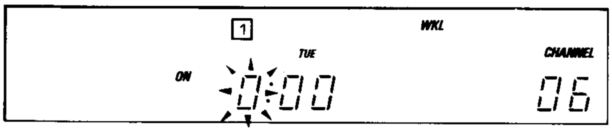
For example, above diagram shows recording on Thursday within 1 week from today.

Notes :

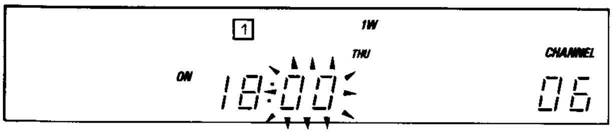
1. To record same time every day of the week:
   Press the SET button (Forward or Reverse) until all day indicators light. Hold down the button to advance rapidly. Then press the STORE button.



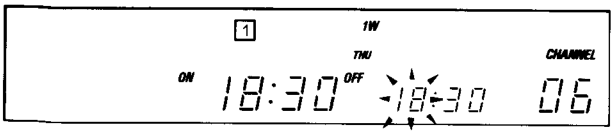
2. To record on a specified day at the same time each week:
   Press the SET button (Forward or Reverse) until the "WKL" indicator lights. Hold down the button to advance rapidly. Then press the STORE button.



5. Select the hour for recording to start by pressing the SET button (Forward or Reverse). Hold down the button to advance rapidly.
   Press the STORE button after selecting the hour for recording to start.
   "00" minutes starts flashing.



   For example, the above diagram shows "18" hours has been set.
6. Select the minutes for recording to start by pressing the SET button (Forward or Reverse). Hold down button to advance rapidly. Press the STORE button after selecting the minute for recording to start.
   "OFF" will appear and "18" hour starts flashing.



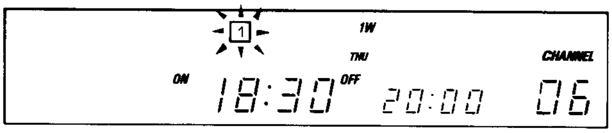
   For example, the above diagram shows "30" minutes has been set.
7. Select the hour and minute to stop recording in the same procedures described in steps 5 and 6. Be sure to press the STORE button after selecting the minute.

   Now, one programming has been completed.
   After few seconds the display returns the clock time display together with letters "[1]" automatically.

8. Turn off the OPERATE switch. The "⊙" indicator will come on.
   Notes:
   1. If the erase prevention tab is removed, the cassette is ejected automatically and "⊙" indication will flash. Stick a piece of cellophane tape over the erase prevention hole on the cassette to enable recording.
   2. The "⊙" indication will flash, if a cassette is not inserted.

To clear a programme

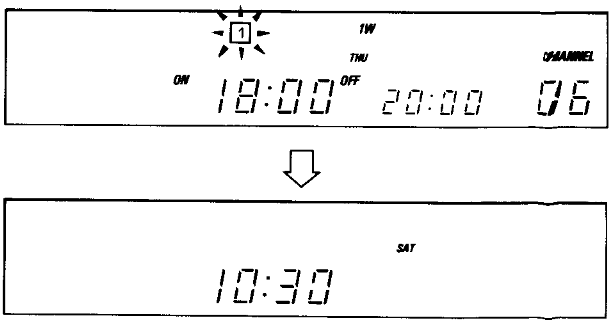
1. Press the SET button (Forward) until desired programme indicator flashes. Then start and stop time appear on the display.



2. Press the CLEAR button.
   The display returns the clock time display to show that the programming has been cleared. Be sure to press the CLEAR button while the display shows the start and stop time. The programming does not clear if the CLEAR button is pressed when the display returns the clock time display.

To check programming

Press the SET button (Forward).
The programme indicator "[1]" flashes. If the programme No. 1 has been already programmed, both start and stop times are displayed in a few seconds. The display then automatically returns to the present time of day.

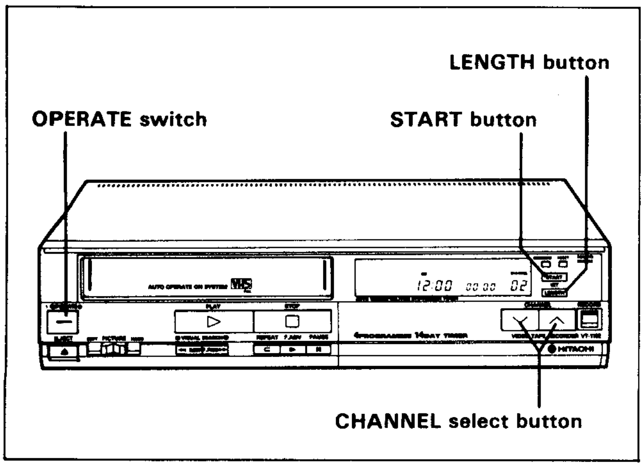


Programming errors

If programmes overlap, the VTR will select the programme with the earliest start time. When that programme is over, the VTR will switch to the next programme. If the start times are the same, the VTR will select the programmes in numerical order.

INSTANT RECORDING TIMER (IRT)

Instant Recording Timer allows you to make simplified timer recording without using the programme timer. There are two simplified methods as explained below.



■ FOR IMMEDIATE RECORDING

1. Insert the cassette (one with the erase prevention tab intact) into the cassette loading door.
2. Press CHANNEL select button to select the channel to be recorded.
3. Press LENGTH button to set the timer to "0:00". Then press LENGTH once again to indicate the recording time on the display. The time changes in hours and minutes in the order of 0:30, 1:00, 1:30, 2:00, 3:00 and 4:00 every time the button is pressed. Recording starts when 0:30 is displayed. During recording, the remaining time is displayed.
4. At the end of recording the display reads 0:00; the VTR will automatically stop recording.

Note: The IRT feature does not operate during play and after a program timer recording has started. During rewind mode, the IRT recording will automatically start after the tape is rewound fully to the end.

■ FOR SIMPLIFIED TIMER RECORDING

1. First perform Steps 1 and 2 of "FOR IMMEDIATE RECORDING".
2. Press START button to select the start time. Each press will change the clock display (the start time) by increments of 10 minutes from the nearest 10 minutes of the hour.
3. Press LENGTH button for the recording time. The counter display is reset to hours and minutes in the order of 0:00, 0:30, 1:00, 1:30, 2:00, 3:00 and 4:00 every time the button is pressed.
4. Press OPERATE switch off, and the "◷" indication will appear on the Display. The recording will start at the time you have selected and will automatically stop when the recording time display reads "0:00".

Notes:

1. The recording time can be extended any time during IRT by pressing LENGTH button . The recording time display will be reset to 0:30, 1:00, 1:30, 2:00, 3:00 or 4:00 as selected.
2. To stop the VTR during IRT, press LENGTH button until the recording time display reads 0:00, or press OPERATE switch and the STOP button within ten seconds.
3. To change the IRT program, the previous information must be first cleared.
4. If IRT and the program timer recording overlap, the former will override the latter.

To recall the IRT program

Press START or LENGTH button for recalling the start time and the recording time. In about 8 seconds the displays return to the present time of day.

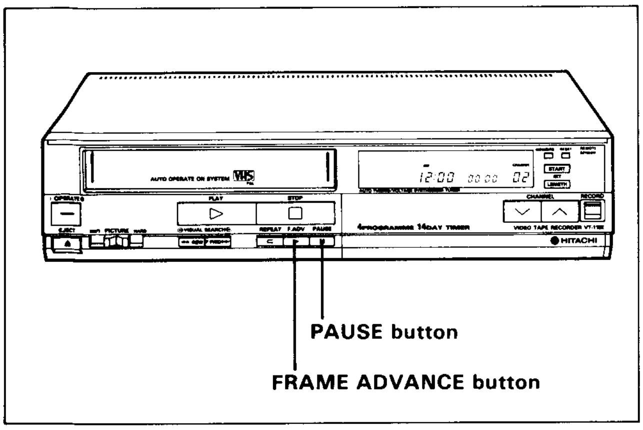
Note: To recall the start time or the recording time, press LENGTH button only once. Pressing more will change the recording time and cause a need for resetting.

To cancel Instant Recording

Press LENGTH button as many as may be required to indicate "0:00" on the display. After approximately 8 seconds the display will return to the present time of day, and IRT has been now cleared.

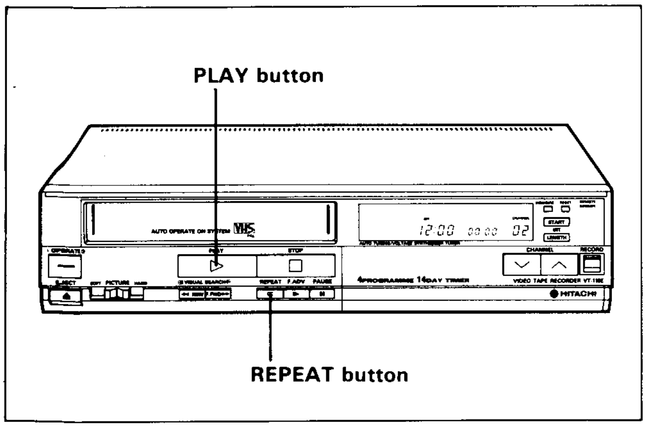
Note: OPERATE switch may be on or off.

Frame advance



When you hold FRAME ADVANCE button down during still playback mode, tape will be played back frame by frame. Operates only after PAUSE button has been pressed.

Repeat function



Use this function to repeat the scene you have just viewed during playback.

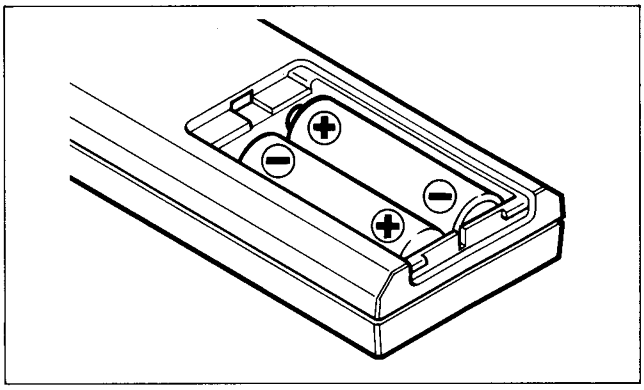
1. During playback, press PLAY button at the scene where you want the repeat of the playback to start. The playback continues.
2. Press REPEAT button. The tape is automatically rewound to the position where PLAY button was pressed, and playback is repeated.

MC-Service

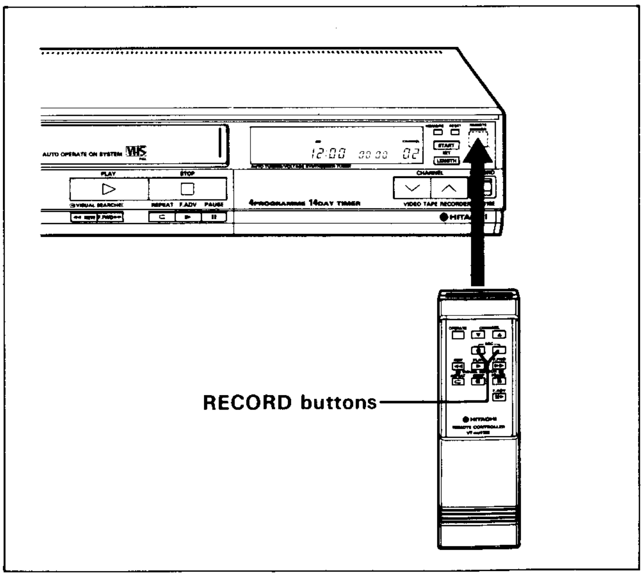
REMOTE OPERATION

You can operate the VTR from a distance using the Infrared Remote Control unit which performs the same functions as the corresponding buttons on the VTR — except for its RECORD buttons.

Power source of infrared remote control unit
The infrared remote control unit is powered by two batteries (size IEC standard R6). The life of the batteries is about a year although it depends on the numbers of times the unit is used. Replace the batteries when operation is not possible or when the distance becomes too small.

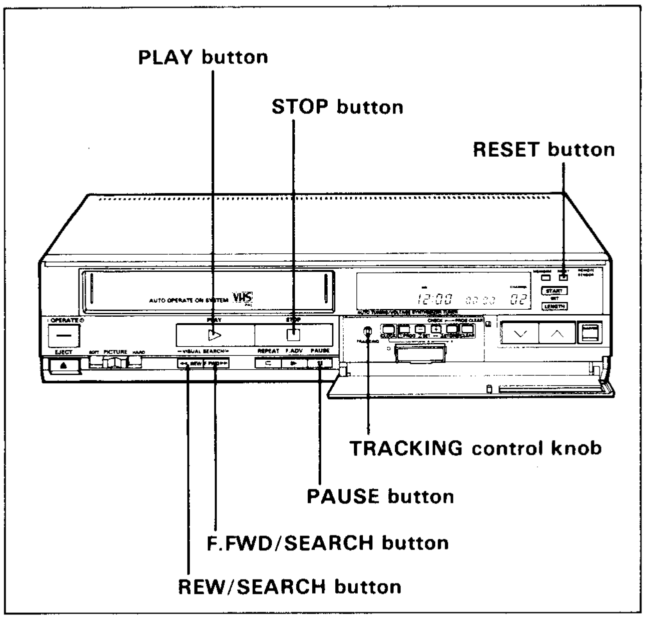


Operation of remote control
To use the infrared remote control unit aim it at the receiver on the front panel of the VTR.



Press RECORD buttons simultaneously on the remote control unit to record.
Note: The infrared rays will bounce off the walls and eventually reach the receiver on the VTR, but for best results transmit rays directly to the receiver.

PLAYBACK



1. Turn the TV set on and select the video channel.
2. Insert the cassette.
3. Press the PLAY button.
4. Press the STOP button to stop playback.

Tracking control adjustment

When playing prerecorded tapes or those recorded on units other than your own, black and white streaks may appear on your TV screen. If this occurs, adjust the TRACKING control until the streaks disappear. When playback of this particular tape is over, readjust the TRACKING control to its original position. The original position is normally in the center position.

Tape counter

This indicates the amount of video tape transported as a number.

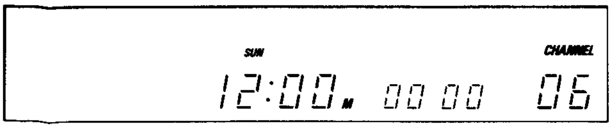
Press the RESET button to set the counter reading to "0000" when starting recording or playing back.

Note the number on the Tape counter at the beginning and end of each programme you record. This will allow you to use the counter to find the desired programme later.

Counter memory function

This is useful if there is a section of tape you want to view immediately after recording or you want to return to the same point several times.

1. Begin recording or playing back a tape.
2. At the point where you want playback to begin, reset the tape counter to "0000" by pressing the RESET button.
3. Press MEMORY button, and the "M" appears on the Display.



4. Continue to play or record.
5. Press the STOP button when recording or playback finishes.
6. Press the REWIND button.

The tape will automatically stop at the pre-selected "0000" position.

Actually, so that you won't miss the very first part of the programme to be viewed, the tape will stop slightly prior to "0000" at approximately the "9997" position.

Note: The counter memory function will also operate during fast-forwarding mode.

Automatic rewind

The VTR automatically rewinds the tape when the end of the tape is reached.

Rewind shut off

If OPERATE switch is pressed during rewind operation, power will be turned off automatically after the tape has been completely rewound.

Still playback

Press the PAUSE button to stop the picture on the screen during playback.

During still playback, press the PAUSE button to return to normal playback or the STOP button to stop the tape.

Notes:

- If you see vertical shaking on the TV screen in the still playback mode, rotate the VERT. SYNC. ADJ. control on the rear of the VTR to minimize shaking.
- When the still playback mode continues for about 5 minutes, the VTR switches to the stop mode automatically to prevent damage to the tape.
- The playback picture will have some noise in the still playback mode.

Visual search

This allows you to view the picture from a recorded tape at high speed in both the forward and reverse directions.

Press the PLAY button to play a tape, then press either the VISUAL SEARCH button REW or F.FWD. Pictures can be viewed at high speed in either the forward or reverse direction.

Note: The playback picture will have some noise in the visual search mode.

CHAPTER 2

DISASSEMBLY

1. NAMES AND LOCATIONS OF CIRCUIT BOARDS

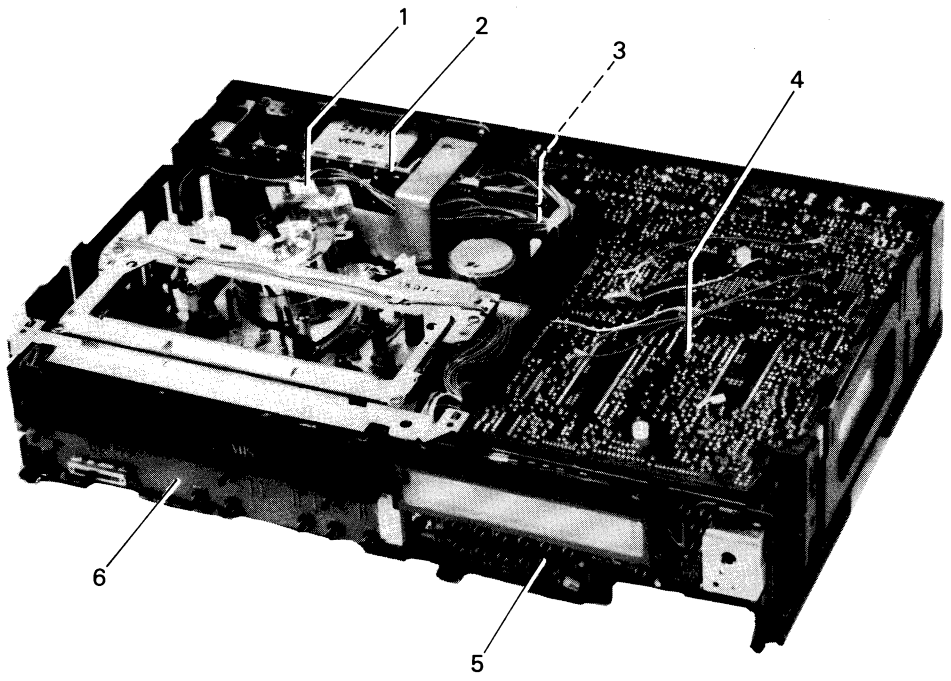


Fig. 1 Top View

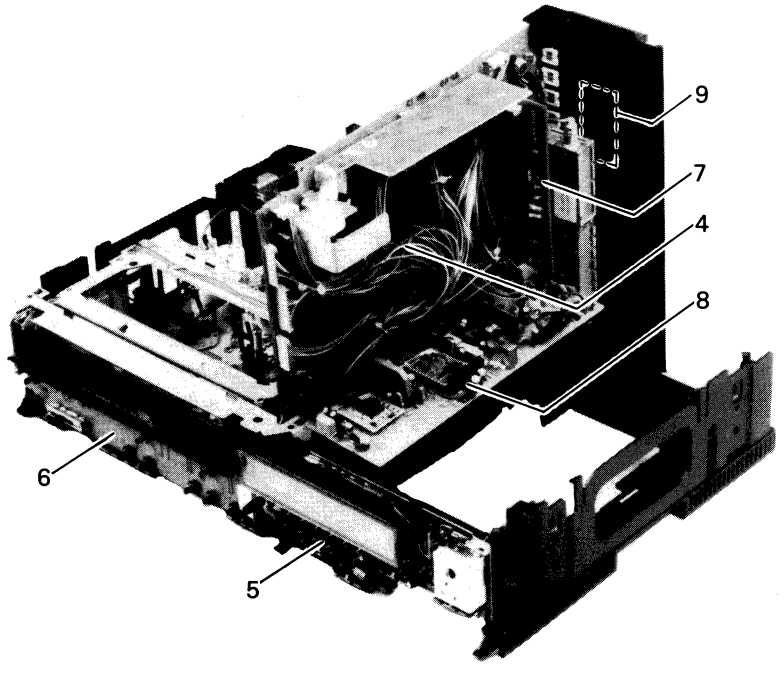


Fig. 2 Top View (with main circuit board open)

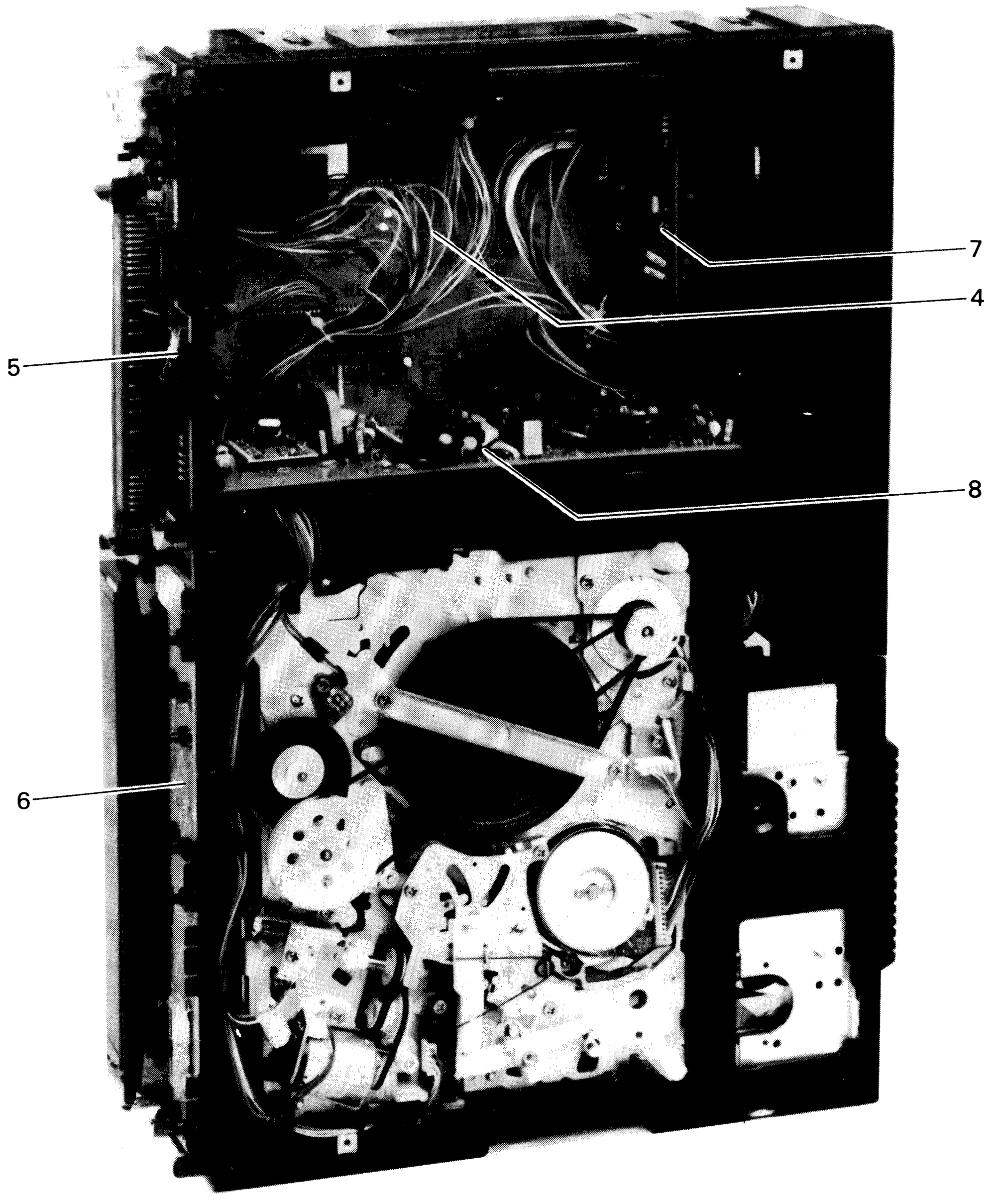


Fig. 3 Bottom View

1. Preamp circuit board
2. Regulator circuit board
3. Cylinder motor driver circuit board
4. Main circuit board
5. Timer circuit board
6. Operation switch circuit board
7. VS tuning circuit board
8. Y/chroma circuit board
9. Buzzer circuit board — VT-120E only —

(See page 2-9 for details on removing these circuit boards.)

2. NAMES AND LOCATIONS OF MAIN MECHANICAL COMPONENTS

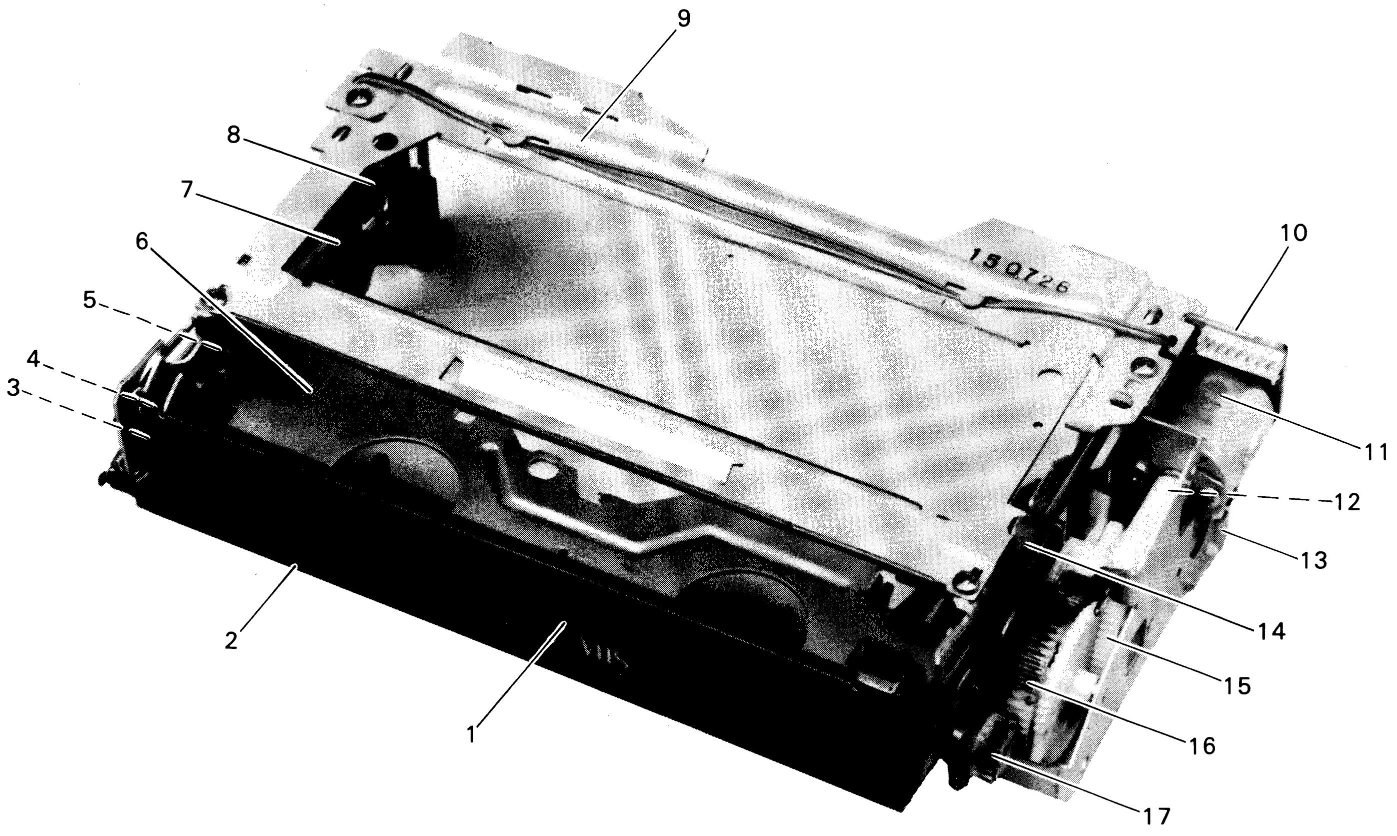


Fig. 4 Cassette Loading Mechanism

1. Cassette door
2. Front holder
3. Synchro gear (L)
4. Door arm
5. Drive gear (L)
6. Cassette holder
7. Side chassis (L)
8. Supply end sensor
9. Chassis holder
10. Cassette loading motor circuit board
11. Cassette loading motor
12. Cassette-in switch
13. Cassette-up switch
14. Side chassis (R)
15. Drive gear (R)
16. Clutch gear
17. Synchro gear (R)

(See page 2-11 for details on removing the above components.)

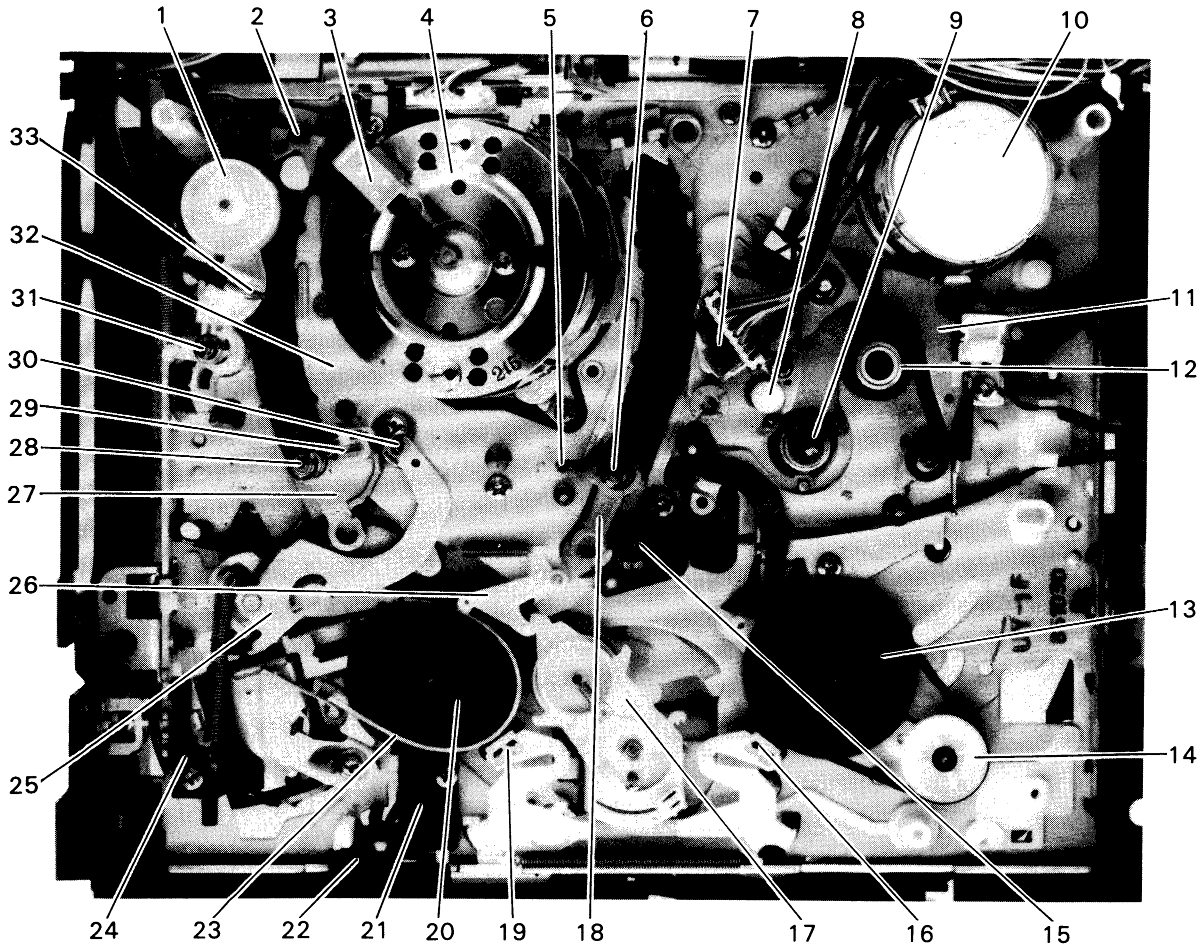


Fig. 5 Top View of Mechanism

1. Impedance roller
2. Catcher/cylinder base
3. Ground brush
4. Upper cylinder (video heads)
5. Inclined guide (take-up)
6. Take-up guide roller
7. A/C (audio/control) head
8. Take-up guide pole
9. Capstan shaft
10. Capstan motor
11. Arm bracket
12. Pressure roller
13. Take-up reel disk
14. Load pulley
15. End lamp
16. Main brake (take-up)
17. Reel drive gear
18. Take-up guide roller base
19. Main brake (supply)
20. Supply reel disk
21. Safety tab switch
22. Record prevention arm
23. Tension band
24. Spring hanger
25. Tension arm
26. Supply sub brake
27. Supply guide roller base
28. Supply guide roller
29. Inclined guide (supply)
30. Tension pole
31. Supply guide pole
32. Subchassis
33. FE (full-erase) head

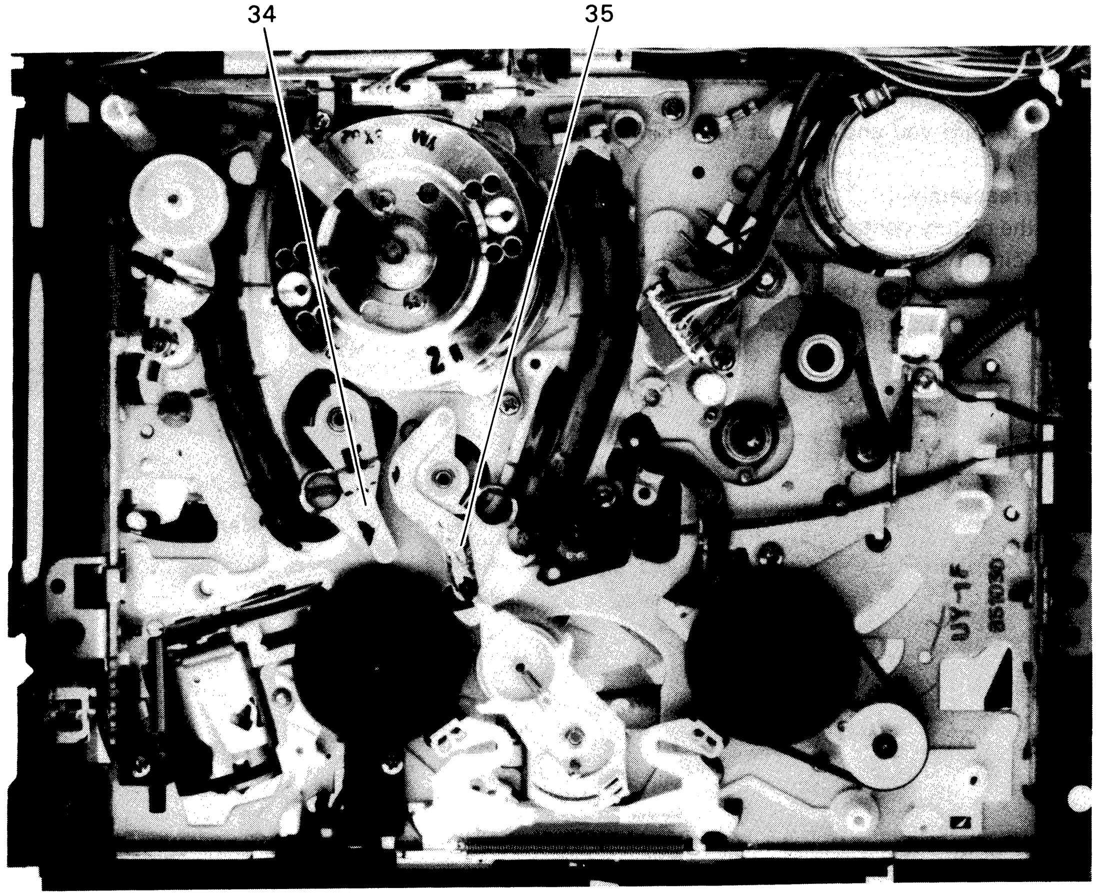


Fig. 6 Top View of Mechanism (with subchassis removed)

34. Supply loading link
35. Take-up loading link

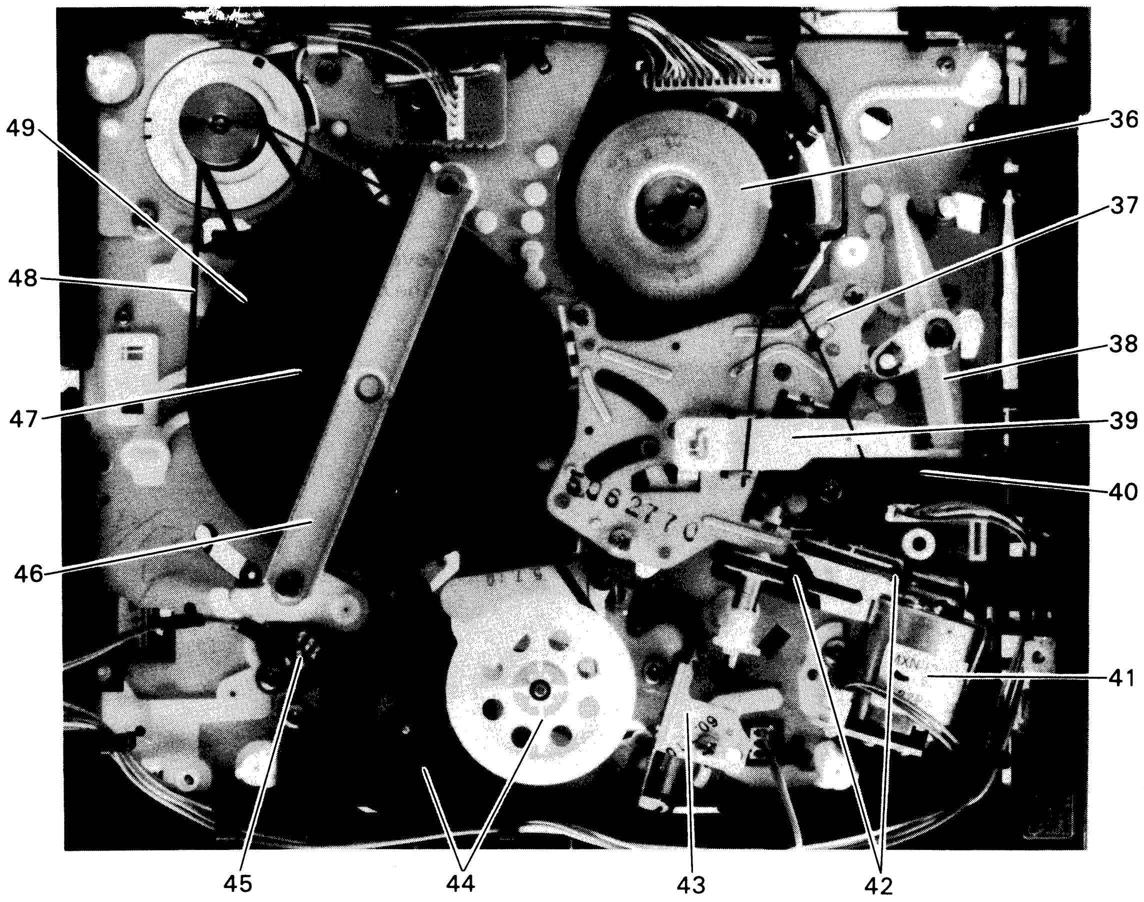


Fig. 7 Bottom View of Mechanism

36. Cylinder motor
37. Loading gear assembly
38. Tension release arm
39. Switch slider
40. Mechanism state switch
41. Loading motor
42. Loading belt
43. Brake slider
44. Clutch plate assembly
45. Reel sensor
46. Flywheel retainer bar
47. Reel belt
48. Capstan belt
49. Capstan flywheel

(See page 2-14 for details on removing the above components.)

3. CASE REMOVAL

1. **Preset door**
2. **Top cover**
3. **Bottom cover**
4. **Front panel**
5. **Shield cover**
6. **Remote controller**

1. Preset Door

1) Open the preset door. Press down on the attachment holder and pull outward in the direction of the arrow.

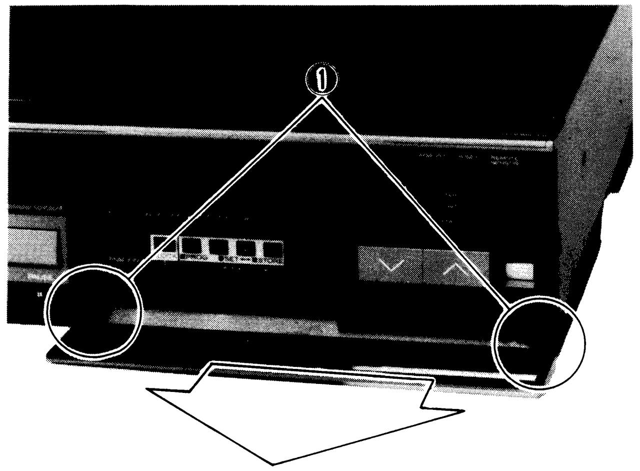


Fig. 1 Preset Door

2. Top Cover

1) Remove the 5 screws.
2) Lift the rear of the top cover upward. Slide the entire cover to the rear.

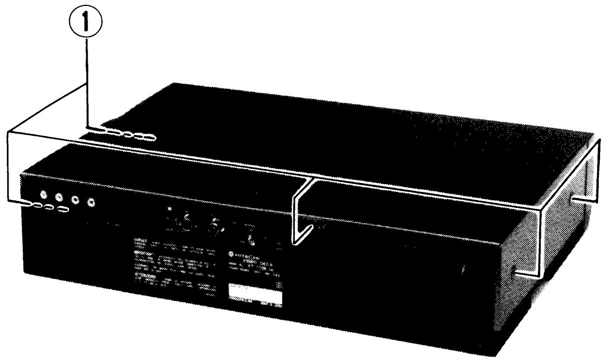


Fig. 2 Top Cover

3. Bottom Cover

1) Remove the 6 screws.

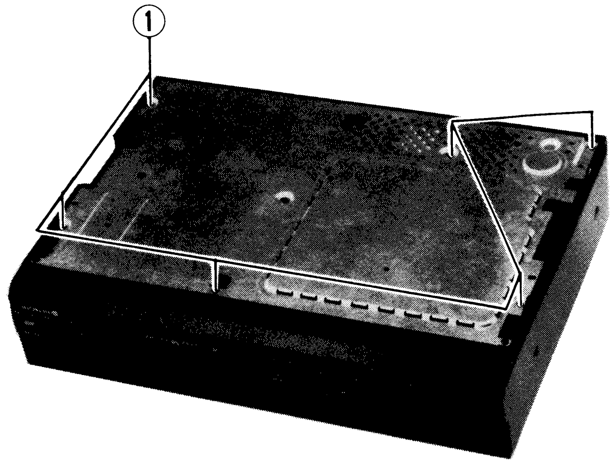


Fig. 3 Bottom Cover

4. Front Panel

1) Remove top and bottom covers (see items 2 and 3).
2) Remove the screw.
3) Release the 5 stoppers.
4) Tilt the top toward you and pull out the entire front panel.

[Cautions during reassembly]

* Make sure the picture control slide lever on the operation switch circuit board is correctly inserted into the picture control knob on the back of the front panel.

* Removing the tracking control knob first will simplify reassembly.

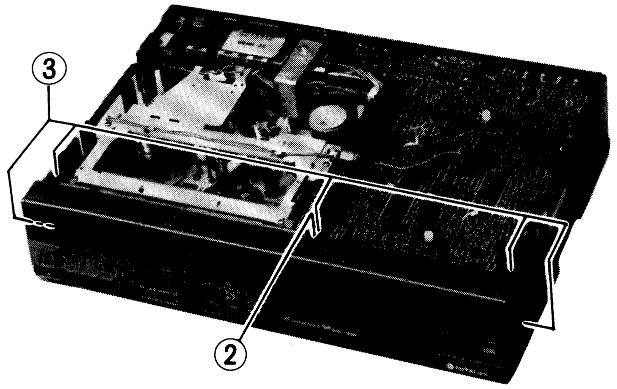


Fig. 4 Front Panel

5. Shield Cover

1) Remove the top cover (see item 2).
2) Remove the screw holding the shield cover.

[Cautions during reassembly]

* Make sure the rear of the shield cover correctly fits over the preamp circuit board's shield case.

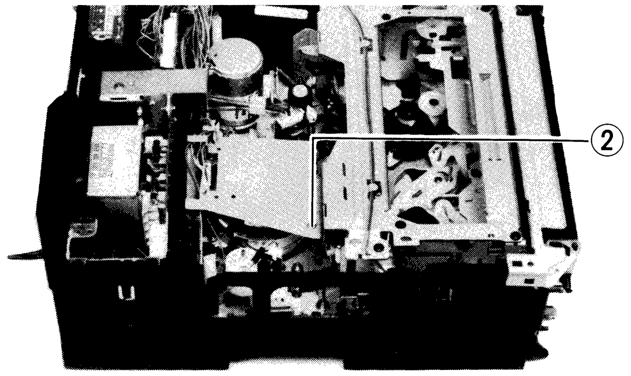


Fig. 5 Shield Cover

6. Remote Controller

1) Release 6 stoppers.

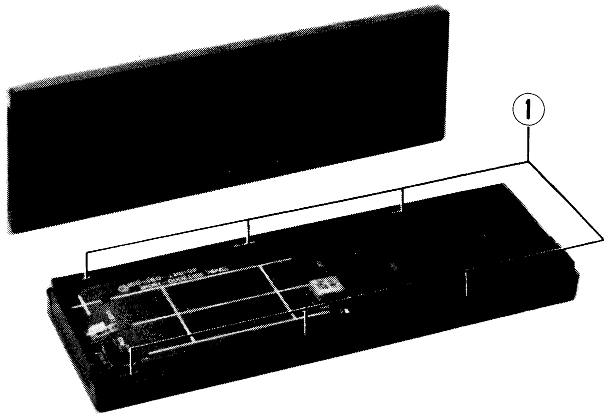


Fig. 6 Remote Controller

4. CIRCUIT BOARD REMOVAL

1. **Main Circuit Board Block** (Main, Y/chroma, VS tuning)
2. **Operation Switch Circuit Board**
3. **Timer Circuit Board**
4. **Regulator Circuit Board**
5. **Preamp Circuit Board**

1. Main Circuit Board Block

1) Remove the top and bottom covers (see items 2 and 3 in the section on case removal.)
2) Release the 2 stoppers.
3) Remove the 2 screws.
4) Push the circuit board holder in the direction of the arrow. Then lift up the entire circuit board.
5) The circuit board can now be opened in the direction of the arrow.

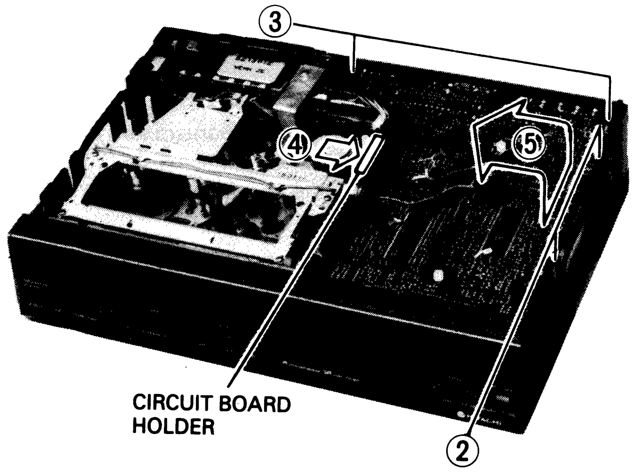


Fig. 1 Main Circuit Board Block

2. Operation Switch Circuit Board (Figs. 2 and 4)

1) Remove the top and bottom covers and the front panel (see items 2, 3 and 4 in the section on case removal.)
2) Disconnect the connector.
3) Release the 6 (5) upper and lower stoppers.

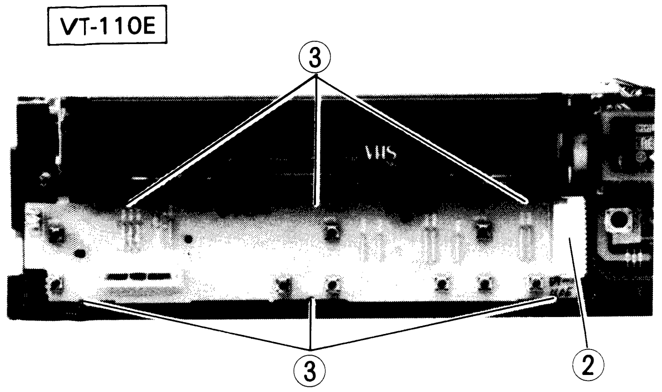


Fig. 2 Operation Switch Circuit Board

3. Timer Circuit Board (Figs. 3 and 4)

1) Remove the top and bottom covers and the front panel (see items 2, 3 and 4 in the section on case removal.)
2) Disconnect the connector.
3) Release the 5 (7) upper and lower stoppers.
4) Remove the 5 screws.

[Cautions while working]

- * Since the backup capacitor retains its charge for approx. 5 minutes after the AC power lead has been unplugged, press the reset switch to discharge the capacitor.

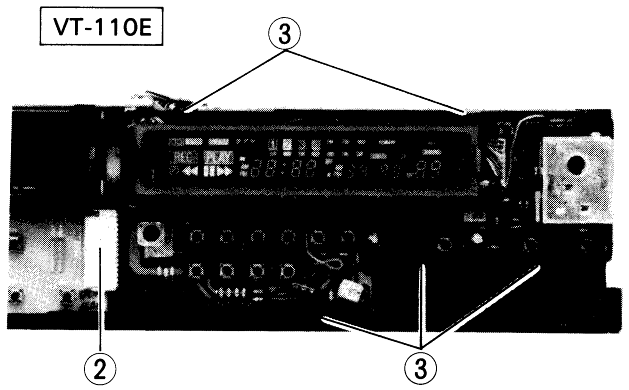


Fig. 3 Timer Circuit Board

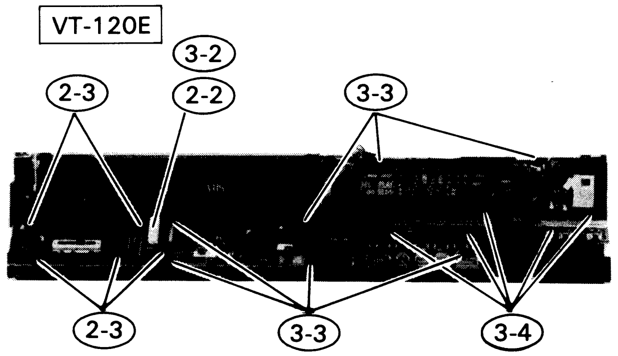


Fig. 4 Operation Switch/Timer Circuit Board

4. Regulator Circuit Board (Figs. 5 and 6)

1) Remove the top cover (see item 2 in the section on case removal).
2) Remove the 2 screws from the bottom cover.
3) Remove the screw holding the heat sink. Remove the heat sink.
4) Remove the 2 screws on the transformer holder.
5) Lift up in the direction of the arrow.

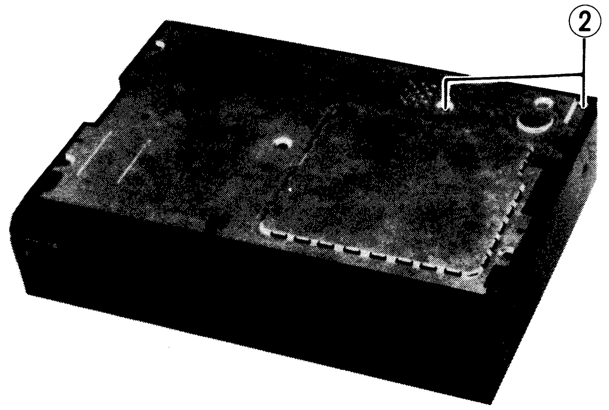


Fig. 5 Bottom Cover

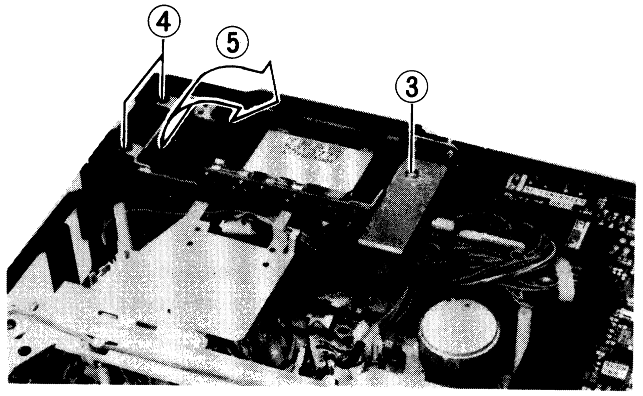


Fig. 6 Regulator Circuit Board

5. Preamp Circuit Board

1) Remove the top cover and the shield cover (see items 2 to 5 in the section on case removal).
2) Pull out and up.

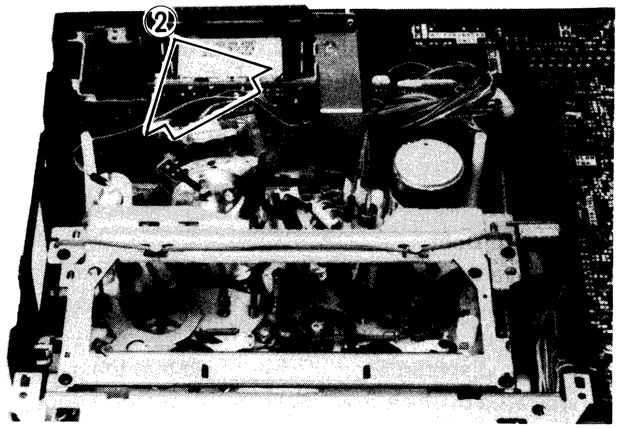


Fig. 7 Preamp Circuit Board

5. CASSETTE LOADING MECHANISM REMOVAL

1. **Cassette Door**
2. **Supply End Sensor**
3. **Chassis Holder**

* Components listed below will be described as if the top and bottom covers, front panel and shield cover have already been removed. (See items 2, 3, 4, and 5 in the section on case removal.)

4. **Cassette Loading Mechanism**
5. **Gear Cover**
6. **Door Arm**
7. **Drive Gear (L)**
8. **Motor Block**
9. **Cassette Loading Motor**
10. **Drive Gear (R)**
11. **Cassette Holder**

1. Cassette Door

1) Remove the top and bottom covers and the front panel (see items 2, 3 and 4 in the section on case removal).
2) Push and spread apart the front holder in the direction indicated by the arrow. Remove the cassette door.

[Cautions during reassembly]

* Make sure the pin on the door arm fit into the groove in the cassette door.

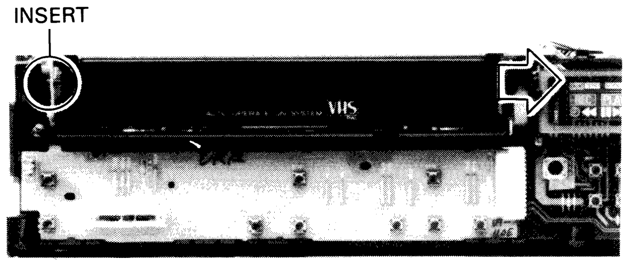


Fig. 1 Cassette Door

2. Supply End Sensor

1) Remove the top cover (see item 2 in the section on case removal).
2) Release the stopper.

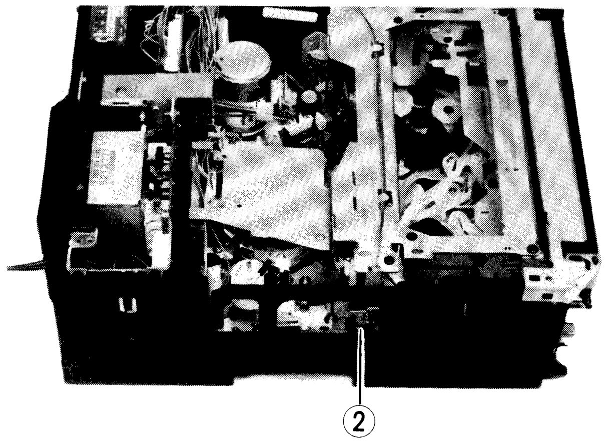


Fig. 2 Supply End Sensor

3. Chassis Holder

1) Remove the top and bottom covers (see items 2 and 3 in the section on case removal).
2) Remove the supply end sensor (see item 2).
3) Release the supply end sensor cord from the chassis holder.
4) Remove the 4 screws.

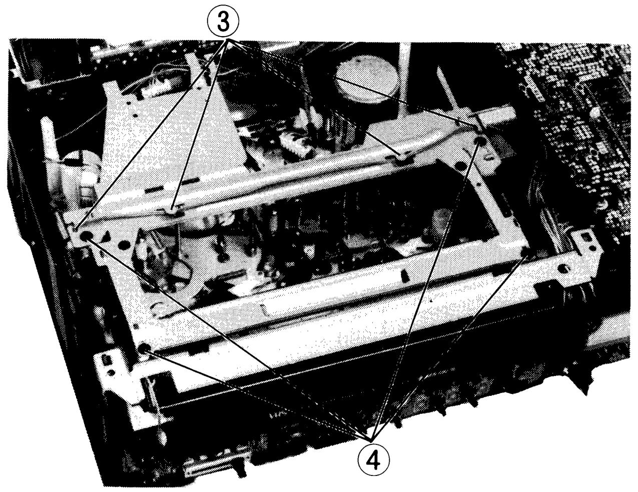


Fig. 3 Chassis Holder

4. Cassette Loading Mechanism

1) Push the reinforcing plate in the direction of the arrow, and lift upward.
2) Disconnect the connector.
3) Remove the 2 screws.
4) Lift the rear end of the mechanism upwards and release the engagement fitting on the bottom front.

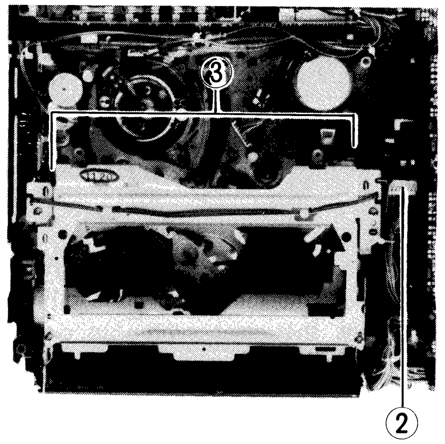


Fig. 4 Cassette Loading Mechanism

5. Gear Cover

1) Remove the cassette loading mechanism (see item 4).
2) Lift section (A) up slightly. Then pull the entire gear cover unit forward.

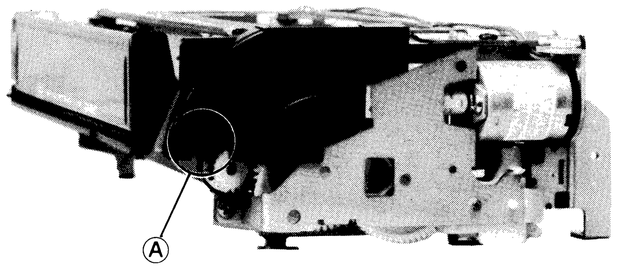


Fig. 5 Gear Cover

6. Door Arm

1) Remove the cassette loaidng mechanism (see item 4.)
2) Remove the spring.
3) Release the 2 stoppers.

[Cautions during reassembly]

* Insert the pin on the front edge of the door arm into the groove in the cassette door.

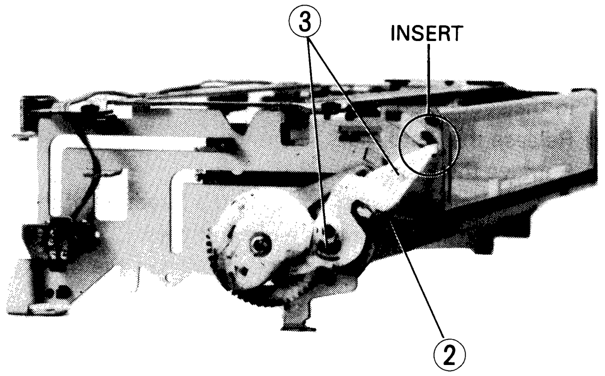


Fig. 6 Door Arm

7. Drive Gear (L)

1) Remove the cassette loading mechanism and the door arm (see items 4 and 6).
2) Release the stopper and pull out the drive gear (L).

[Cautions during reassembly]

* Align the triangular mark on the drive gear (L) with the triangular mark on the synchro gear (L).

* Insert the pin on the cassette holder into the groove in the drive arm.

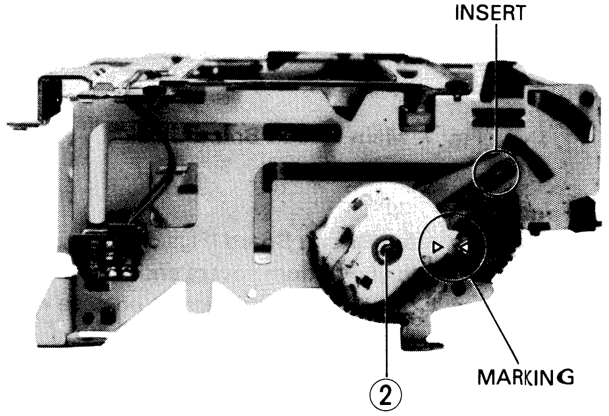


Fig. 7 Drive Gear (L)

8. Motor Block

1) Remove the cassette loading mechanism, the gear cover, the supply end sensor and the chassis holder (see items 4, 5, 2 and 3).
2) Remove the 2 screws holding the motor block.

[Cautions during reassembly]

- * Place the cassette holder in the unloaded position (prior to cassette insertion). Align the triangular markings on the synchro gear and the clutch gear.
- * Insert the slide pin on the cassette holder into the groove in the clutch gear's drive arm.

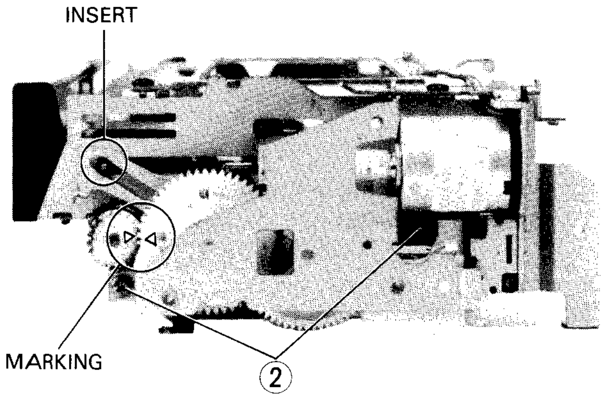


Fig. 8 Cassette Loading Motor Block

9. Cassette Loading Motor

1) Remove the cassette loading mechanism, the gear cover, the supply end sensor, the chassis holder and the motor block (see items 4, 5, 2, 3 and 8).
2) Remove the 2 screws holding the cassette loading motor.

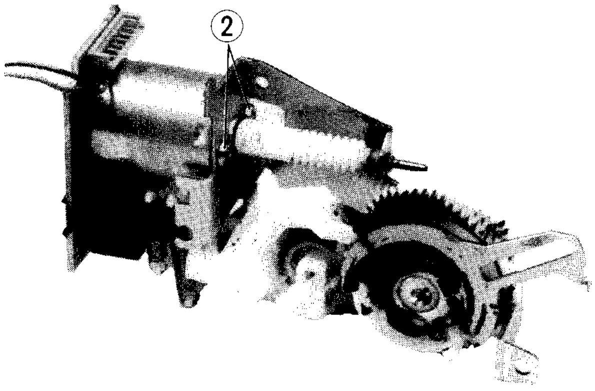


Fig. 9 Cassette Loading Motor

10. Drive Gear (R) (Figs. 10, 11 and 12)

1) Remove the cassette loading mechanism, the gear cover, the supply end sensor, the chassis holder and the motor block (see items 4, 5, 2, 3 and 8).
2) Remove the 2 springs. Pull the switch lever out.
3) Turn the drive arm counterclockwise and pull the clutch gear out.
4) Release the stopper. Pull out another gear.
5) Remove the screw holding the gear holder.

[Cautions during reassembly]

- * Position the triangular marking on the drive gear (R) so that it faces the worm gear. (See Fig. 11). The (○) and triangle can also be seen from the outside so that correct position can be checked after reassembling the motor block. (See Fig. 12)
- * Align marking (▷) on drive gear (R) with projection (ᗤ) on the clutch gear. (See Fig. 11)
- * Attach the spring on the clutch gear to both gears (See Fig. 11)

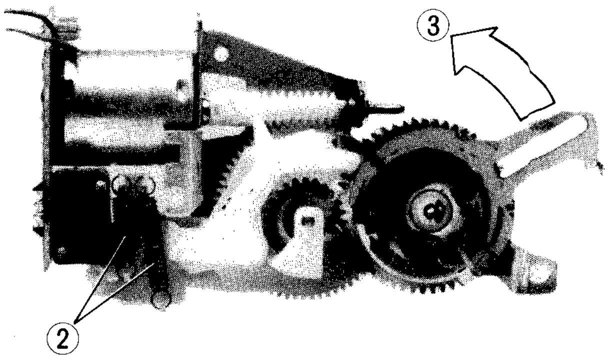


Fig. 10 Drive Gear (I)

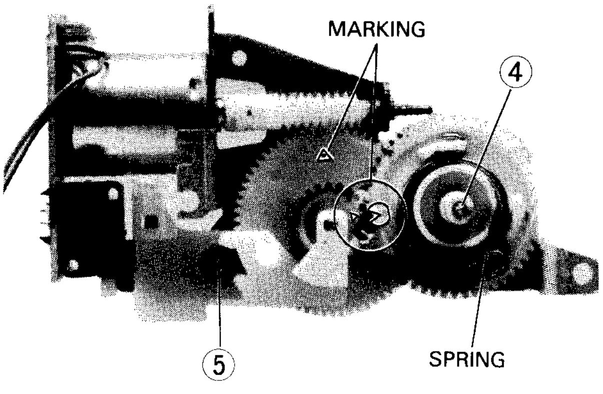


Fig. 11 Drive Gear (II)

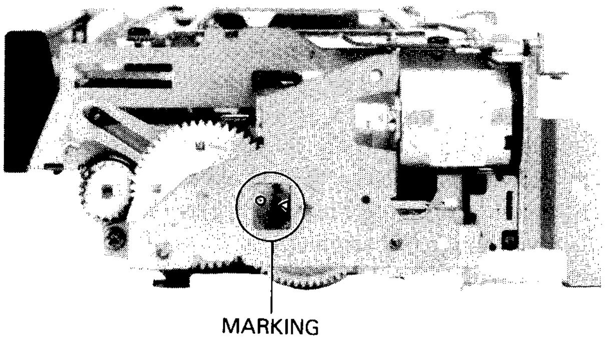


Fig. 12 **Marking on Gear**

11. Cassette Holder

1) Remove the cassette loading mechanism, the gear cover, the supply end sensor, the chassis holder and the motor block (see items 4, 5, 2, 3 and 8).
2) Remove the screw on top of the front holder. Remove the side chassis (R).

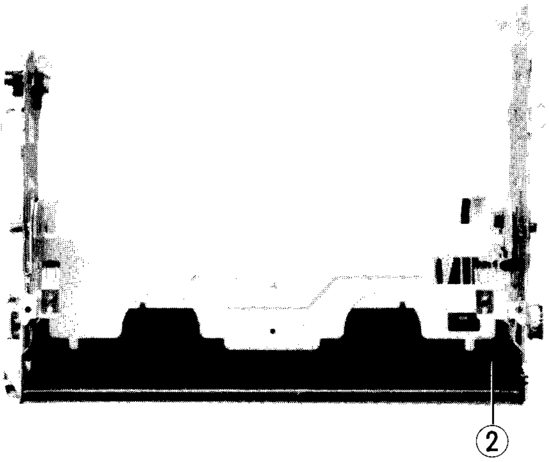


Fig. 13 **Cassette Holder**

6. MAIN MECHANICAL COMPONENTS REMOVAL

Heads

1. **Upper Cylinder (Video Heads)**
2. **Impedance Roller and FE (Full Erase) Head**
3. **A/C (Audio Control) Head**

Motors

4. **Cylinder Assembly**
   Rotor Magnet
   FG Coil
5. **Capstan Motor**
6. **Loading Motor**

Sensors, Switches

7. **End Lamp**
8. **Reel Sensor**
9. **Mechanism State Switch**
10. **Safety Tab Switch**

Others

11. **Main Brake**
12. **Subbrake**
13. **Supply Guide Pole**
14. **Take-up Guide Pole**
15. **Reel Drive Gear**
16. **Take-up Reel Disk**
17. **Load Pulley**
18. **Tension Arm/Tension Band**
19. **Guide Roller**
20. **Supply Reel Disk**
21. **Pressure Roller**
22. **Arm Bracket**
23. **Guide Base and Loading Link**
24. **Clutch Plate Assembly**
25. **Capstan Flywheel**
26. **Brake Slider**
27. **Loading Gear Assembly**

1. Upper Cylinder (Video Heads) (Figs. 1 and 2)

1) Remove the top cover and shield cover (see items 2 and 5 in the section on case removal)
2) Remove the screw holding the brush. Remove the earth brush.
3) Remove the 2 screws holding the upper cylinder. Pull the upper cylinder out.

[Cautions while working]

- * Since the upper cylinder has connectors, do not apply pressure in the direction of rotation. Pull the cylinder vertically upward in the direction of cylinder attachment.
- * Do not touch the video head tips with fingers or tools.

[Cautions during reassembly]

- * Insert so that the arrow on the rotary transformer matches the blue side of the video head connector.
- * Alternately tighten the 2 screws holding the upper cylinder.

[Adjustments after reassembly]

○ Adjustments after replacing the cylinder

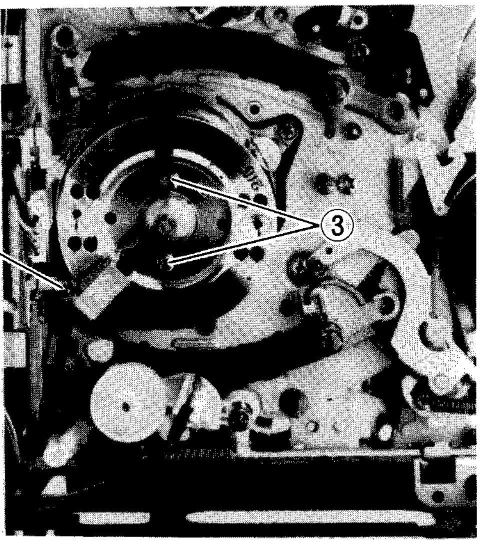


Fig. 1 Video Head

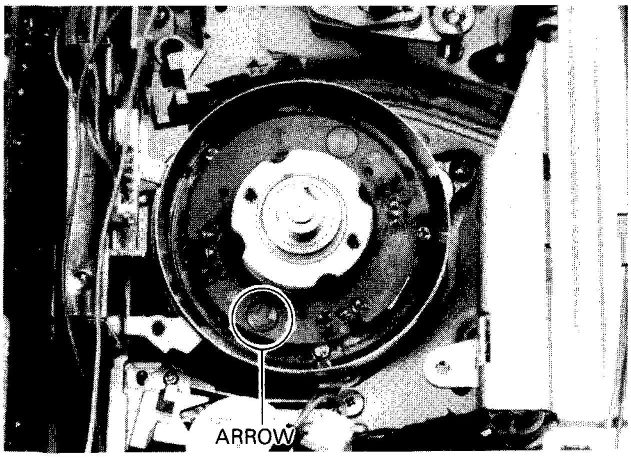


Fig. 2 Rotary Transformer

2. Impedance Roller and FE (Full Erase) Head

1) Remove top cover and shield cover (see items 2 and 5 in the section on case removal).
2) Disconnect the connector.
3) Remove the spring attached between the FE head base and the chassis.
4) Remove the lock nut on the guide pole and then pull the guide pole, spring and washer out.
5) Pull up the FE head together unit the base and out.
6) Then with the FE head removed, remove the screw on the back of the base.

[Adjustments after reassembly]

○ Guide pole height adjustment

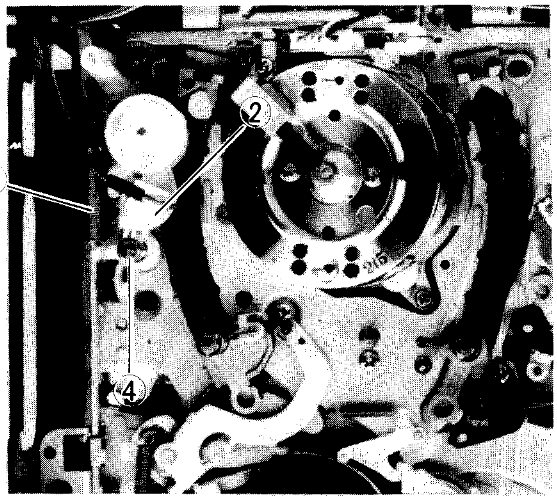


Fig. 3 FE Head

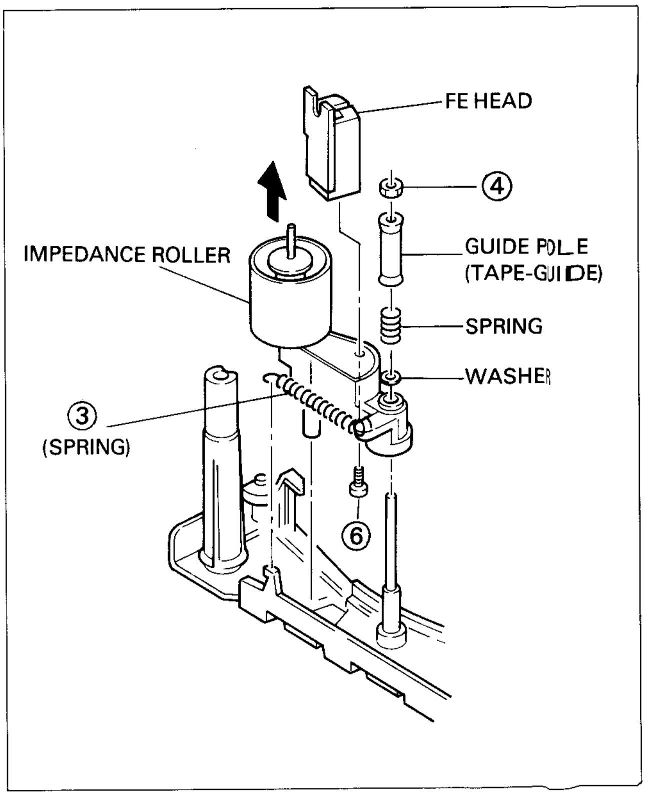


Fig. 4 FE Head

3. A/C (Audio/Control) Head (Figs. 5 and 6)

1) Remove the top cover (see item 2 in the section on case removal).
2) Release the lead from the wire guide. Pull out the connector.
3) Remove the lock nut and washer from the head base. Pull up the base and out.

* Apply the bottom of the spring under the head base to the stopper on the chassis, the top of the spring to the stopper on the base. (Fig. 6)

[Cautions during reassembly]

* Make sure the tip of the A/C head lock screw protrudes 3 to 4 mm from the top surface of head base 1.

* Make sure that head base 1 and head base 2 are parallel.

[Adjustments after reassembly]

○ A/C head adjustment
○ X value adjustment
○ Audio playback level adjustment
○ Audio bias level adjustment

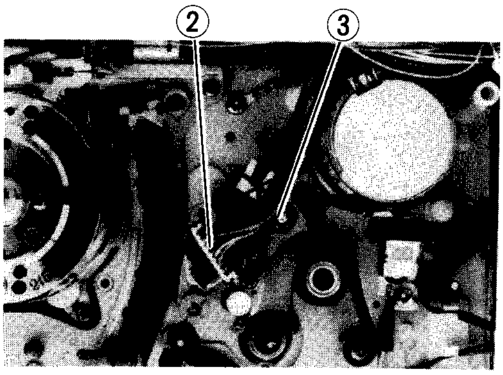


Fig. 5 AC Head

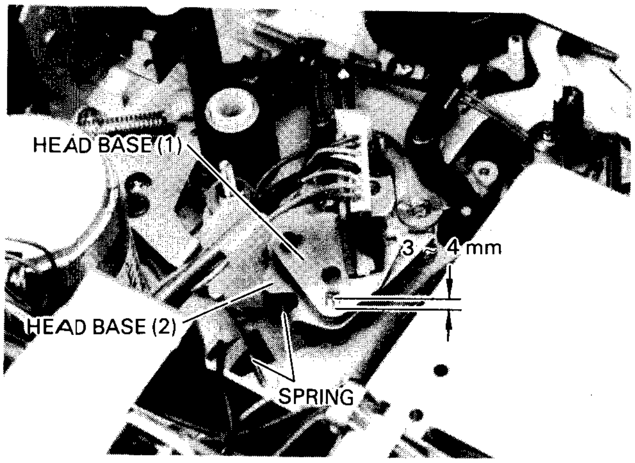


Fig. 6 Spring and Lock Screw

4. Cylinder Assembly

1) Remove the top cover and shield cover (see items 2 and 5 in the section on case removal).
2) Pull out the preamp circuit board.
3) Remove the bottom cover (see item 3 in the section on case removal.)
4) Disconnect the connector from the FG circuit board.
5) Remove the 3 screws holding the cylinder.
6) Remove the cylinder assembly from the top.

[Cautions during reassembly]

* Since the screws position on the back of the assembly, place the unit with the left side down to remove the screws.

* Do not touch the video head tips with fingers or tools.

[Adjustments after reassembly]

○ Adjustments after replacing the cylinder

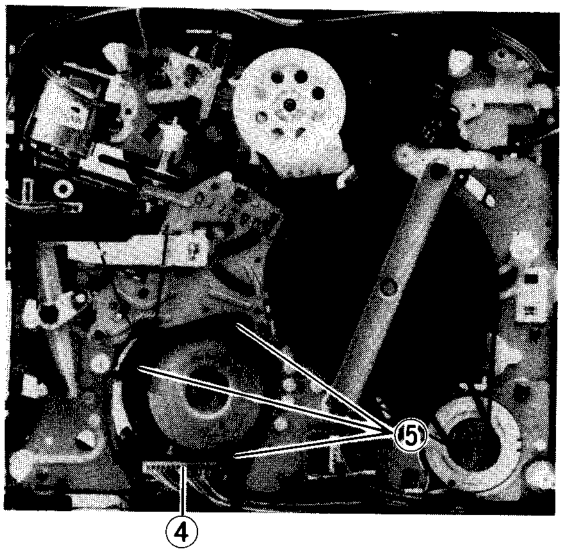


Fig. 7 Cylinder Assembly

[Removing only the rotor magnet and FG coil]
(Figs. 8 and 9)

a) Remove the bottom cover (see item 3 in the section on case removal).
b) Remove the 2 screws on the rotor. Pull the rotor magnet out.
c) Remove the 3 screws holding the FG coil.

[Cautions during reassembly]

- Fit the slot on the cylinder rotating spindle into the protrusion on the rotor side, then lock the rotor magnet with the screws.

[Adjustments after reassembly]

○ Switching point adjustment

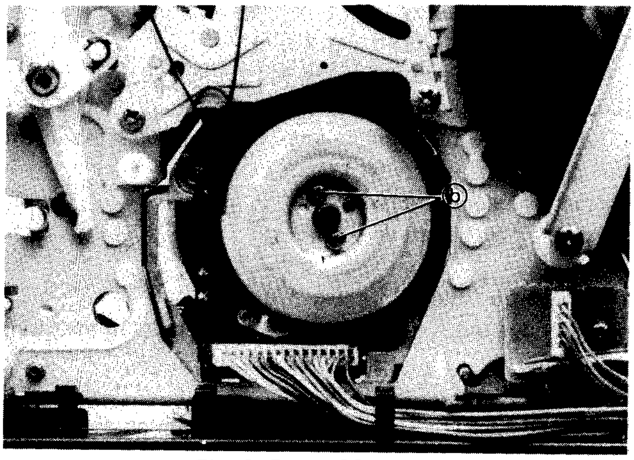


Fig. 8 Rotor Magnet

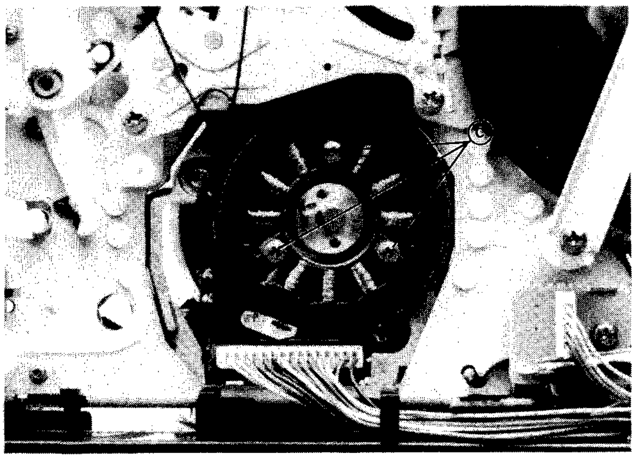


Fig. 9 FG Coil

5. Capstan Motor

1) Remove bottom cover (see item 3 in the section on case removal).
2) Remove the reel belt.
3) Remove the flywheel belt.
4) Disconnect the connector from the capstan motor circuit board.
5) Remove the 2 screws holding the capstan motor holder. Pull out the capstan motor holder.

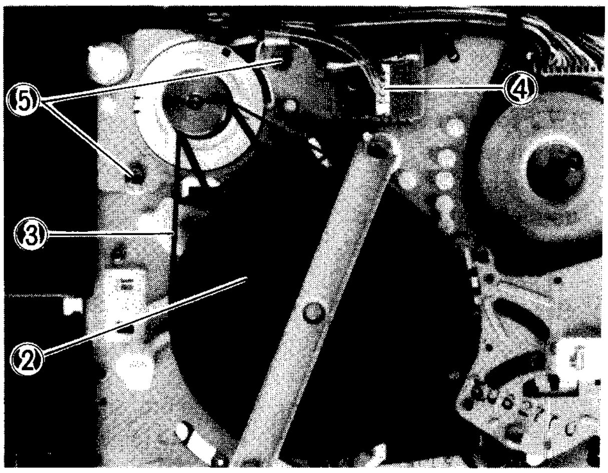


Fig. 10 Capstan Motor

6. Loading Motor

1) Remove the bottom cover (see item 3 in the section on case removal.)
2) Remove the loading belt.
3) Disconnect the connector from the loading motor circuit board.
4) Remove the screw holding the loading motor.

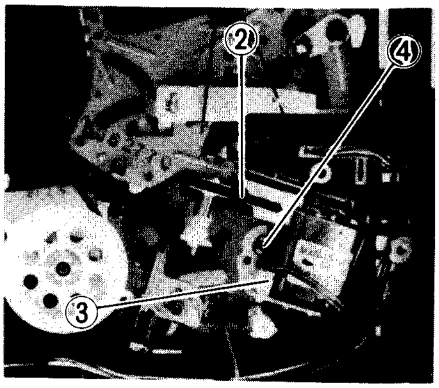


Fig. 11 Loading Motor

7. **End Lamp** (Fig. 13)
   1) Remove the top cover (see item 2 in the section on case removal).
   2) Remove the screw holding the end lamp.

8. **Reel Sensor** (Fig. 12)
   1) Remove the bottom cover (see item 3 in the section on case removal).
   2) Remove the screw holding the reel sensor.

9. **Mechanism State Switch** (Fig. 12)
   1) Remove the bottom cover (see item 3 in the section on case removal).
   2) Disconnect the connectors
   3) Remove the screw holding the mechanism state switch.

[Adjustments after reassembly]

○ Mechanism state switch adjustment

10. **Safety Tab Switch** (Figs. 12 and 13)
    1) Remove the top and bottom covers (see items 2 and 3 in the section on case removal).
    2) Disconnect the connector from the bottom side.
    3) Remove the screw holding the safety tab switch.

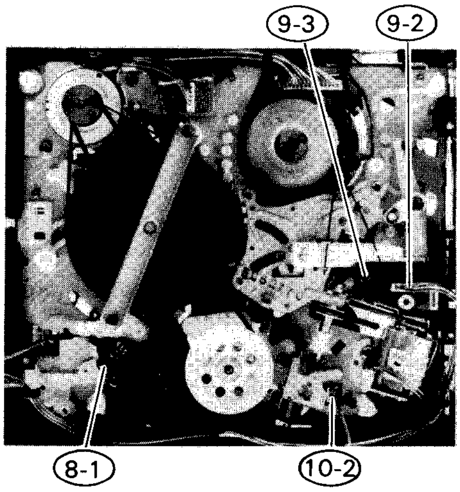


Fig. 12 Bottom View of Mechanism

* Components in items 11 to 17 are described as if the top cover has already been removed. See item 2 in the section on case removal.

11. **Main Brakes** (Fig. 13)
    1) Remove the spring between the supply and take-up brakes.
    2) Release each section engaged with the chassis.

12. **Supply Subbrake** (Fig. 13)
    1) Remove the spring between the subchassis and the brake.
    2) Release the section engaging the brake spindle.

13. **Supply Guide Pole** (Fig. 13)
    1) Remove the screw holding the guide pole.

[Cautions during reassembly]

* Make sure the washer and spring are inserted in the guide pole attachment shaft.

[Adjustments after reassembly]

○ Guide pole height adjustment

14. **Take-up Guide Pole** (Fig. 13)
    1) Remove the cap. Remove the screw holding the guide pole.

[Cautions during reassembly]

* Make sure the spring is inserted in the guide pole attachment shaft.

[Adjustments after reassembly]

○ Guide pole height adjustment

15. **Reel Drive Gear** (Fig. 13)
    1) Push the spring holder in the direction of arrow to pull the spring holder up and out.

16. Take-up Reel Disk (Fig. 13)

1) Remove the rubber belt across the load pulley and reel disk.
2) Remove the washer from the top of the disk.

[Cautions during reassembly]

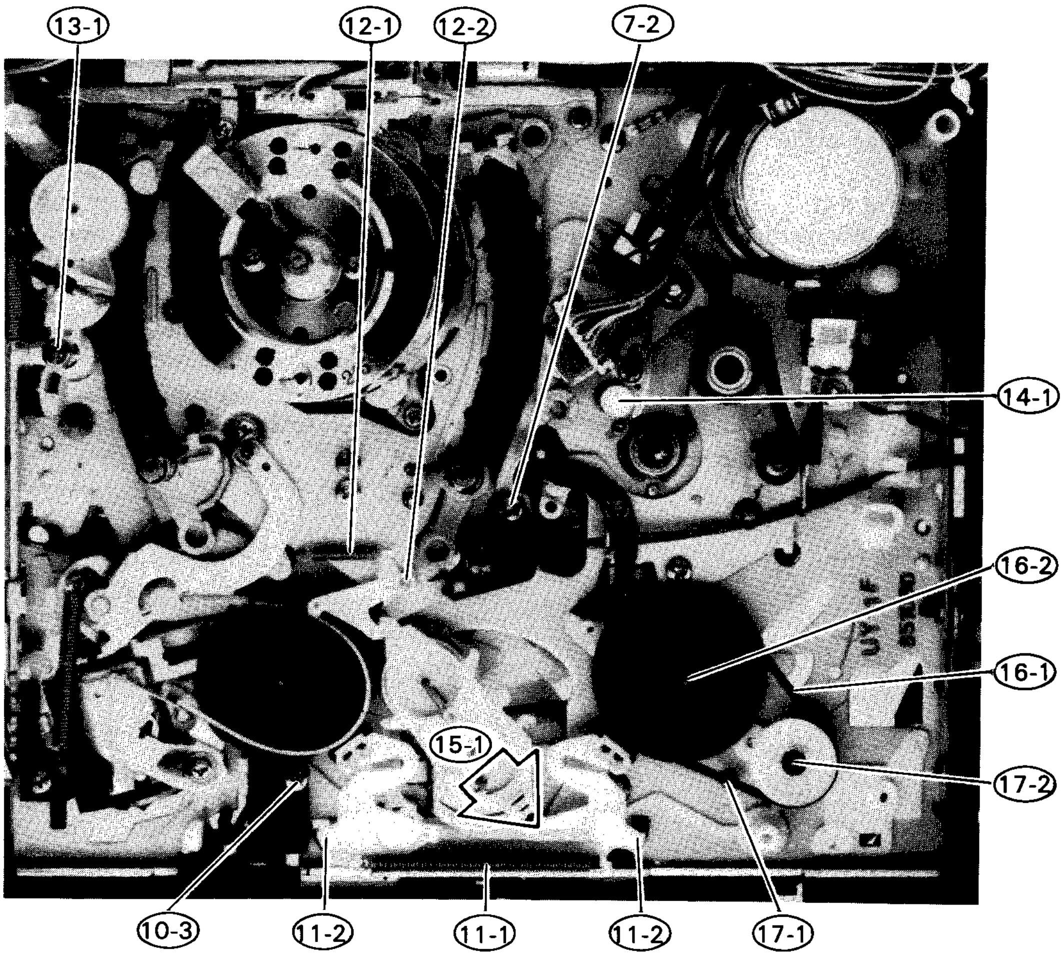
* Make sure the washer is inserted in the reel disk attachment shaft.

[Adjustments after reassembly]

○ Reel disk height adjustment

17. Load Pulley (Fig. 13)

1) Remove the rubber belt across the pulley and the reel disk.
2) Remove the washer from the top of the pulley.



MC-Service

Fig. 13 Top View of Mechanism

* Components in items 18 to 23 are described as if the top and bottom covers, the front panel, the shield cover, and cassette loading mechanism have already been removed. See item 4 in the section on cassette loading mechanism removal and items 2, 3, 4 and 5 in the section on case removal.

18. Tension Arm/Tension Band (Fig. 14)

1) Remove spring (18-1) across the tension arm and spring holder.
2) Remove the screw holding the tension band.
3) Release the engagement section with the tension arm. Pull out the tension arm and tension band.

[Adjustments after ressembly]

○ Tension/tension pole position Adjustments

19. Guide Roller (Fig. 14)

* Remove the supply and take-up sides in the same way.

1) Loosen the hex lock nut on the guide roller.
2) Turn the guide roller counterclockwise to remove.

[Adjustments after reassembly]

○ Guide roller height adjustment

20. Supply Reel Disk (Fig. 14)

1) Remove the supply subbrake and tension arm/tension band (see items 12 and 18).
2) Remove the washer from the top of the disk.

[Cautions during reassembly]

* Make sure the washer and collar are inserted in the reel disk attachment shaft.

[Adjustments after reassembly]

○ Tension/tension pole position Adjustments

○ Reel disk height adjustment

21. Pressure Roller (Fig. 14)

1) Remove washer.

22. Arm Bracket Assembly (Fig. 14)

1) Remove the take-up reel disk and pressure roller (see items 16 and 21).
2) Release the 2 leads from the chassis.
3) Remove the 2 screws. Pull out the arm bracket assembly.

[Cautions during reassembly]

* Insert operation arm spindle into slot in take-up brake operation arm.
* Insert drive arm spindle into slot in link piece.

23. Guide Base/Loading Link (Fig. 14)

1) Remove supply subbrake and tension band/tension arm. (See items 12 and 18)
2) Remove the 3 screws holding the subchassis. Remove the subchassis and guide base.

[Cautions during reassembly]

* When reinstaling the loading link, make sure that the projection on the loading gear is aligned with the groove in the loading link.
* When reinstalling the guide base, make sure that the pin on the back of the guide base is inserted into the slot in the loading link.

[Adjustments after reassembly]

○ Tension/tension pole position Adjustments

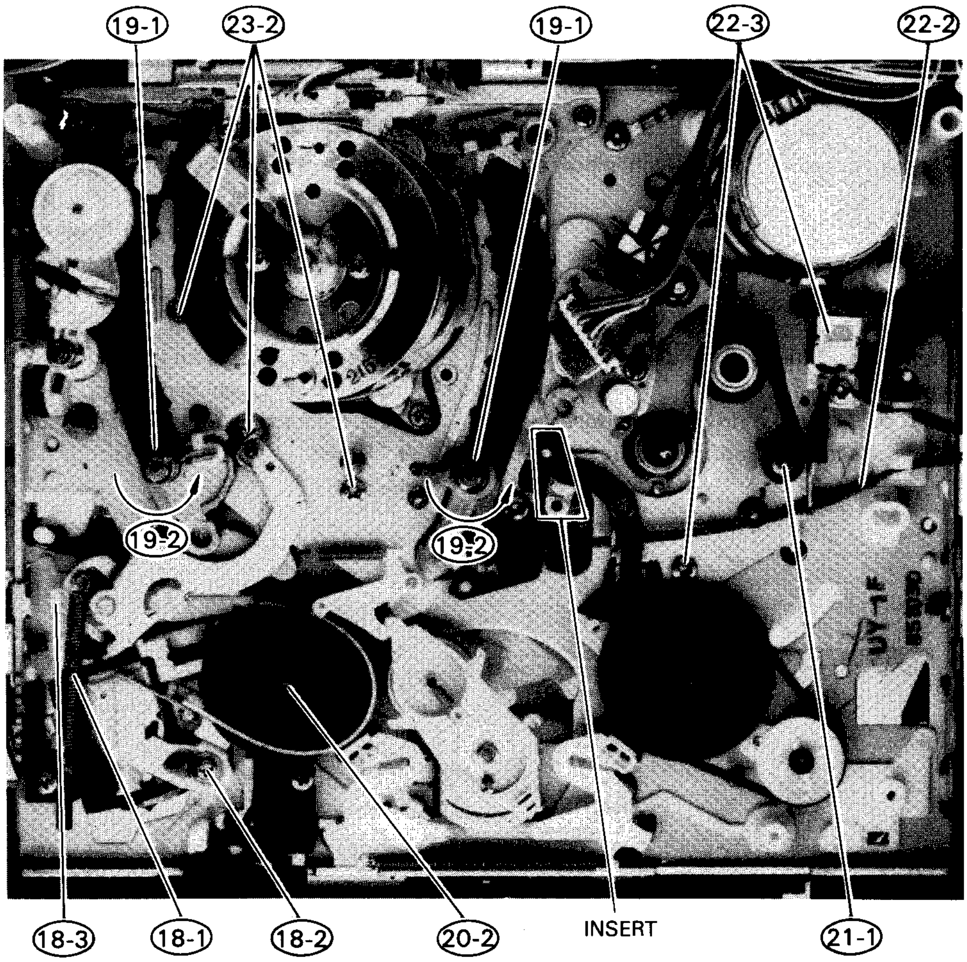

19-1
23-2
19-1
22-3
22-2
19-2
19-2
18-3
18-1
18-2
20-2
INSERT
21-1

Fig. 14 Top View of Mechanism

* Components in items 24 to 26 are described as if the top and bottom covers have already been removed. (See items 2 and 3 in the section on case removal)

24. Clutch Plate Assembly (Fig. 15)

1) Remove the reel drive gear (see item 15).
2) Remove reel belt.
3) Remove the 2 screws holding the clutch plate assembly.

25. Brake Slider (Fig. 15)

1) Remove the reel drive gear and clutch plate assembly (See items 15 and 24).
2) Remove the screw holding the brake slider.

[Cautions during reassembly]

* Make sure the pin on the brake drive arm is inserted into the groove on the slider operating section.

26. Capstan Flywheel (Fig. 15)

1) Remove the 2 screws holding the flywheel retainer bar. Remove the flywheel retainer bar.
2) Remove the nylon washer from the top of the capstan shaft.
3) Remove the reel belt and flywheel belt. Remove the flywheel.

[Cautions during reassembly]

* Make sure the washer is inserted between the bottom side of the chassis and the flywheel.

[Adjustments after reassembly]

○ Reference oscillation frequency adjustment

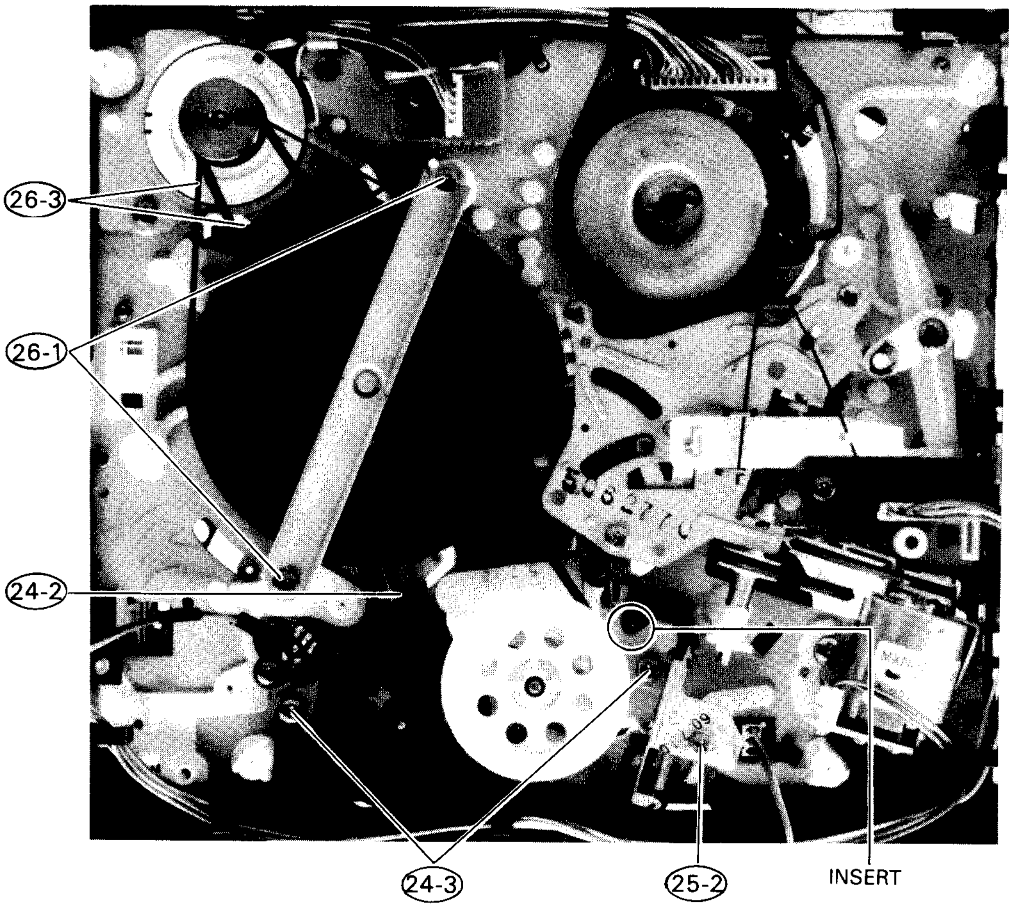


Fig. 15 Bottom View of Mechanism

27. Loading Gear Assembly (Figs. 16 and 17)

1) Remove the top and bottom covers (see items 2 and 3 in the section on case removal).

Top Side

2) Remove the 2 screws from the top of the subchassis.
3) Remove the reel drive gear. (See item 15)

Bottom Side

4) Remove the mechanism state switch, clutch plate assembly, brake slider and capstan flywheel. (See items 9, 24, 25 and 26.)
5) Remove the spring and switch slider from the loading gear assembly.
6) Remove tension release arm.
7) Remove loading belt.
8) Remove the 3 screws holding the loading gear assembly.

[Cautions during reassembly]

- * Insert the pin on the take-up subbrake drive arm into the slot on the take-up subbrake operation arm.
- * Insert the pin on the pressure roller drive arm into the slot on the pressure roller operation arm.

[Adjustments after reassembly]

○ Mechanism state switch adjustment

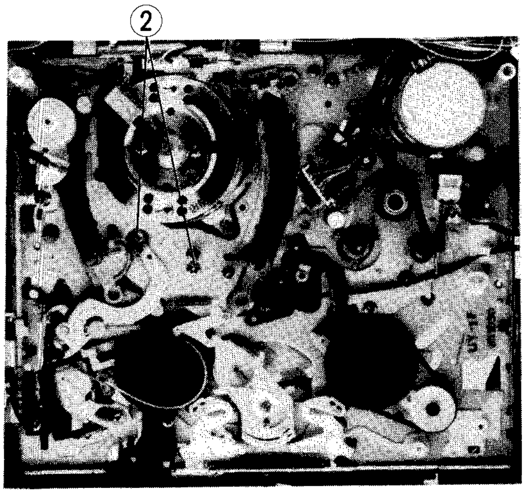


Fig. 16 Top View of Mechanism

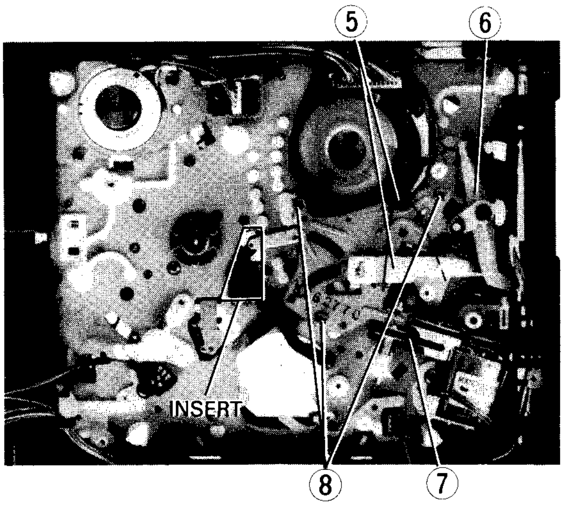


Fig. 17 Loading Gear Assembly (with items in 9, 24, 25 and 26 removed)

ELECTRIC CIRCUIT ADJUSTMENT

Test equipment and tapes necessary for adjustment.

1) Oscilloscope
2) Colour bar generator
3) VTVM
4) Frequency counter
5) Monitor TV
6) Alignment tape
7) Blank tape

Cautions on adjustments

1) If there are no special instructions, the following conditions apply:
   - ○ Oscilloscope probe: 10 : 1
   - ○ Oscilloscope synchronization: Auto-Sync
   - ○ Tracking control: center click.
2) When making more than one adjustment, make those adjustments in the order listed.

Resetting microprocessors

All microprocessors installed in the unit will be reset once the AC power lead is removed from the wall socket. However, the timer microprocessor's back-up circuit keeps it from resetting until about five minutes after power off.

The timer microprocessor can be reset by switch S759 on the timer circuit board. (Switch S759 can be operated by inserting a screwdriver into the round slot adjacent to the PRESET switch even when the front panel is attached.)

Adjust the main circuit board (servo and audio circuits) with the main circuit board open as shown in Fig. 1.

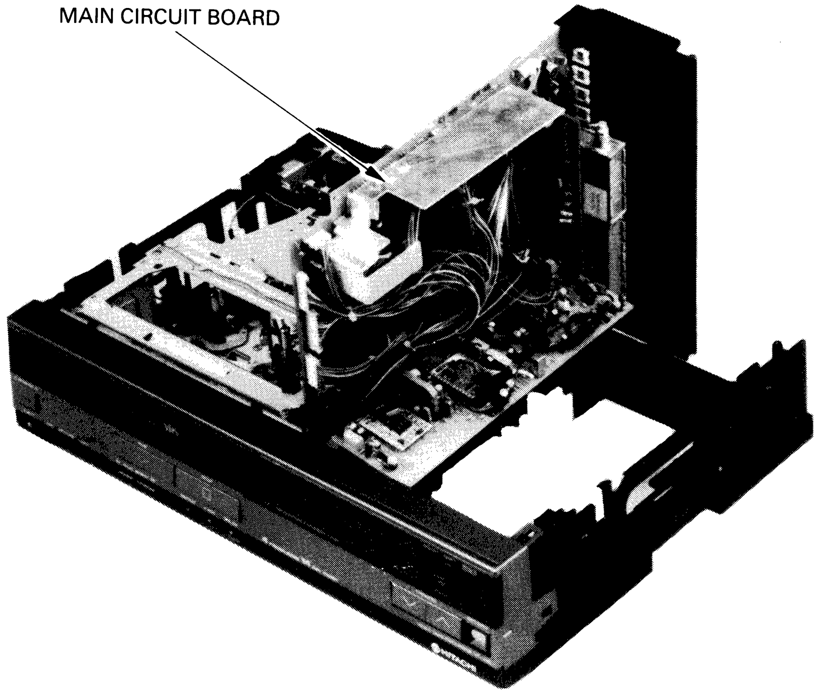


Fig. 1 Ready to Adjust Main Circuit Board

Adjust the Y/chroma circuit board with the left side down and the circuit board open as shown in Fig. 2.

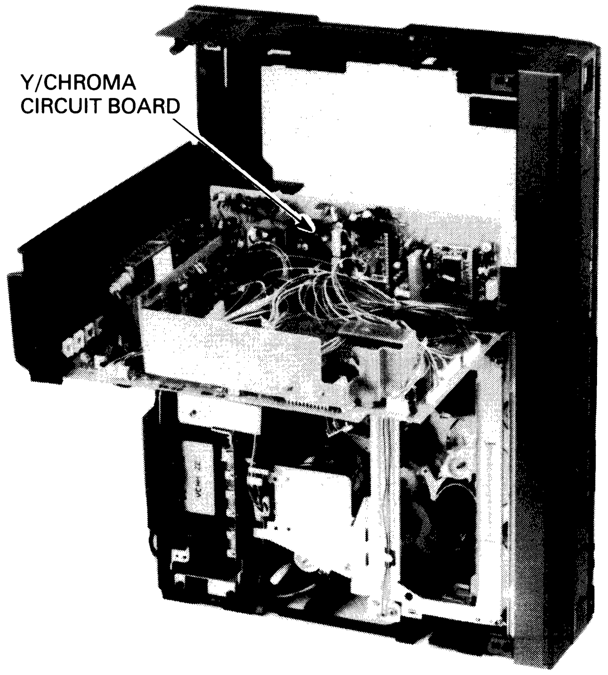


Fig. 2 Ready to Adjust Y/Chroma Circuit Board

* See item 1 in chapter 2 on circuit board removal, for details on main circuit board removal.

COMPONENTS LOCATIONS ON CIRCUIT BOARDS

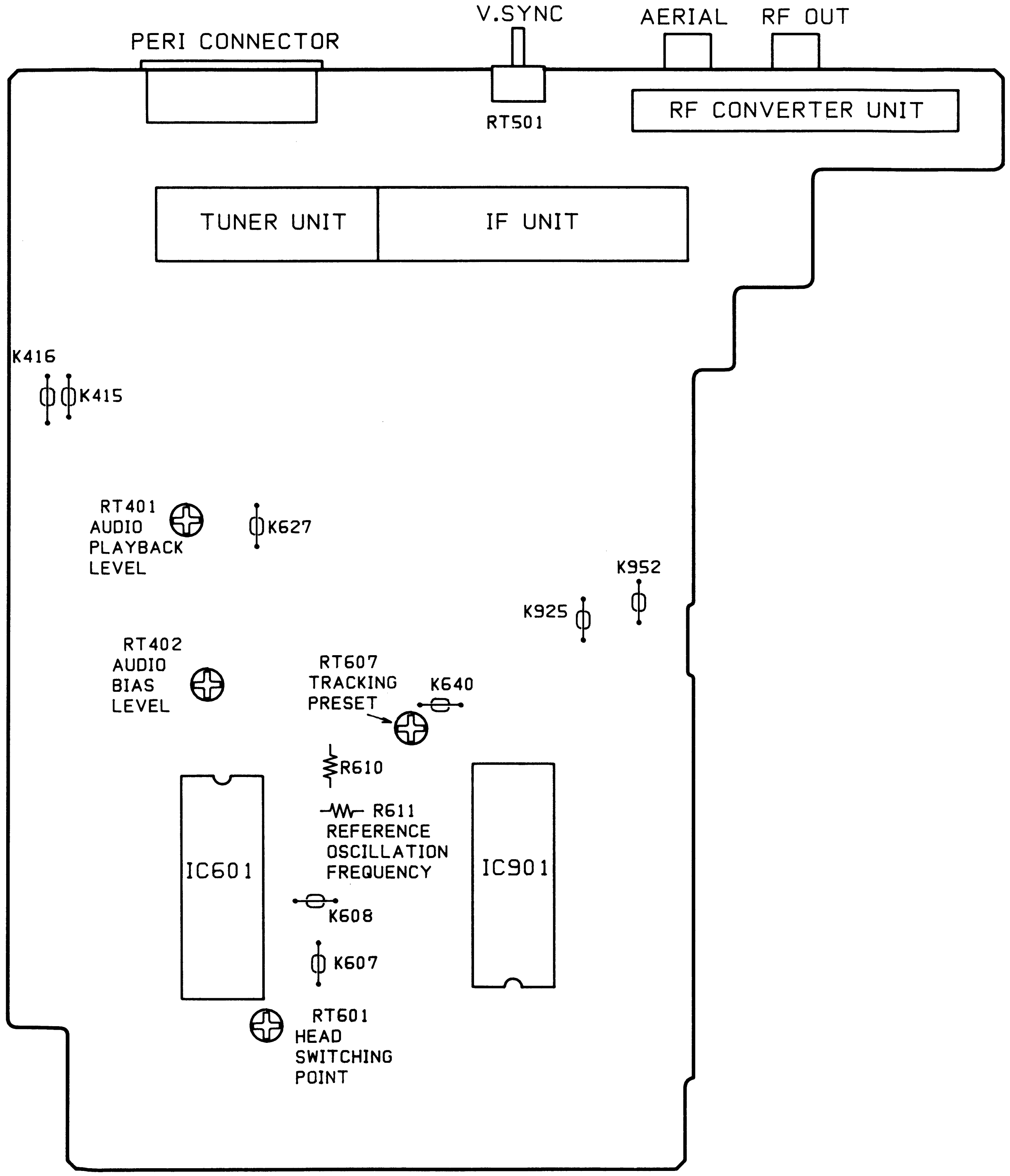

PERI CONNECTOR
V.SYNC
RT501
AERIAL
RF OUT
RF CONVERTER UNIT
TUNER UNIT
IF UNIT
K416
K415
RT401
AUDIO
PLAYBACK
LEVEL
K627
K952
K925
RT402
AUDIO
BIAS
LEVEL
RT607
TRACKING
PRESET
K640
R610
R611
REFERENCE
OSCILLATION
FREQUENCY
IC601
IC901
K608
K607
RT601
HEAD
SWITCHING
POINT

Fig. 3 Components on Main Circuit Board (Component Side)

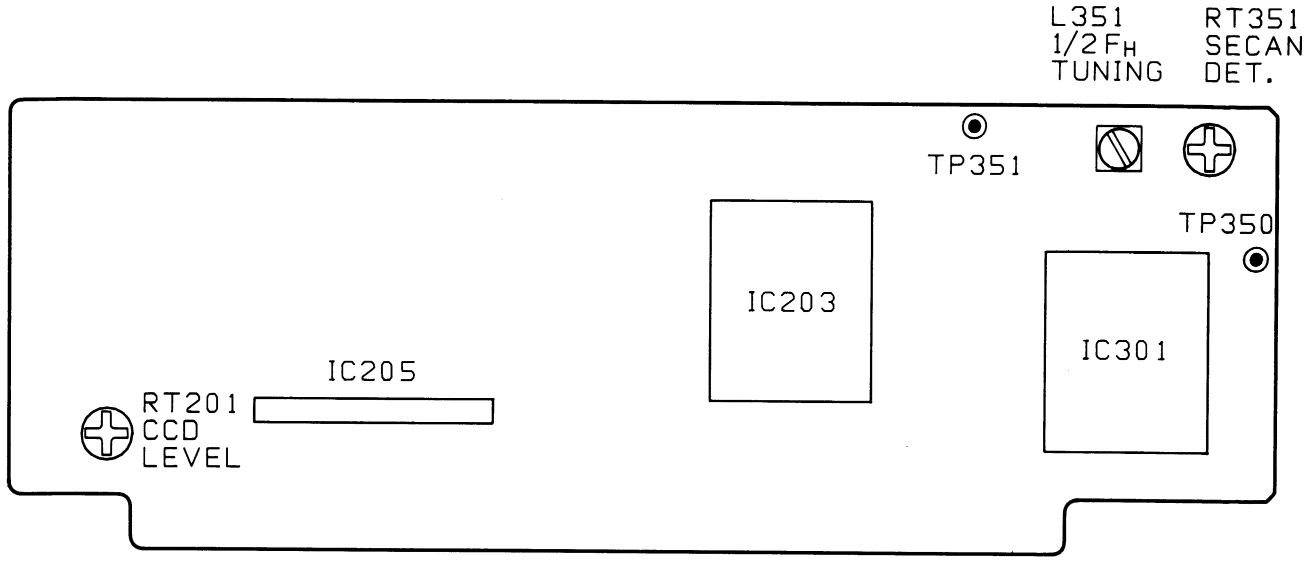

L351
1/2 FH
TUNING
RT351
SECAN
DET.
TP351
TP350
IC203
IC301
IC205
RT201
CCD
LEVEL

Fig. 4 Components on Y/Chroma Circuit Board (Component Side)

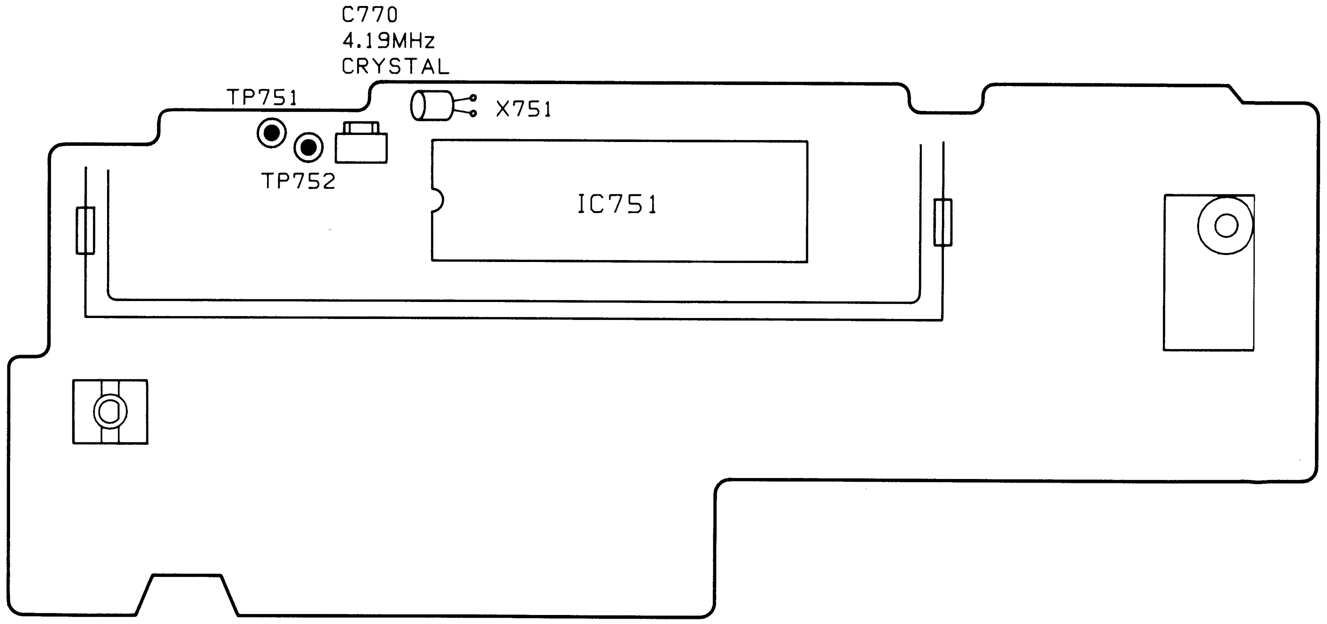

C770
4.19MHz
CRYSTAL
TP751
X751
TP752
IC751

Fig. 5 Components on Timer Circuit Board (Component Side) — VT-110E —

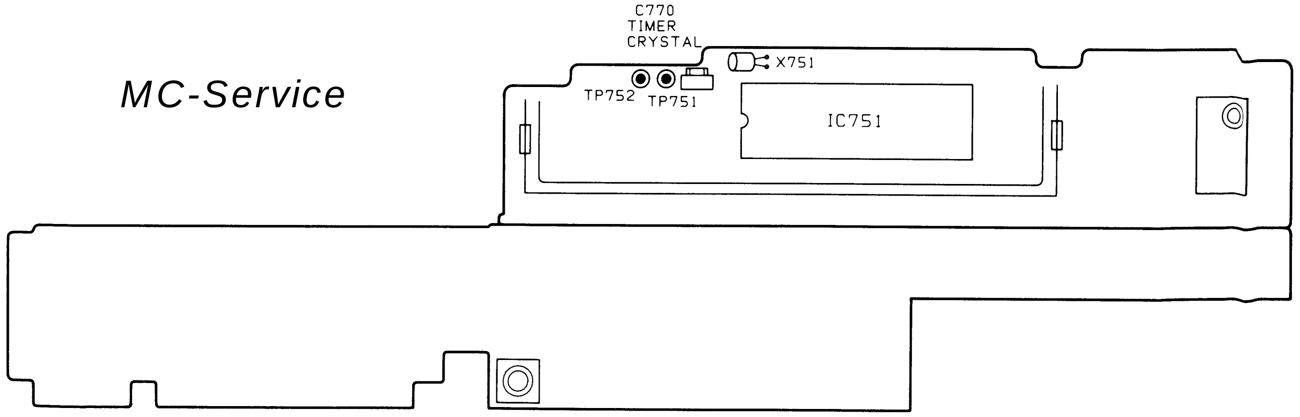

C770
TIMER
CRYSTAL
X751
TP752
TP751
IC751

Fig. 6 Components on Timer Circuit Board (Component Side) — VT-120E —

1. SERVO CIRCUIT ADJUSTMENTS

1. Reference Oscillation Frequency Adjustment

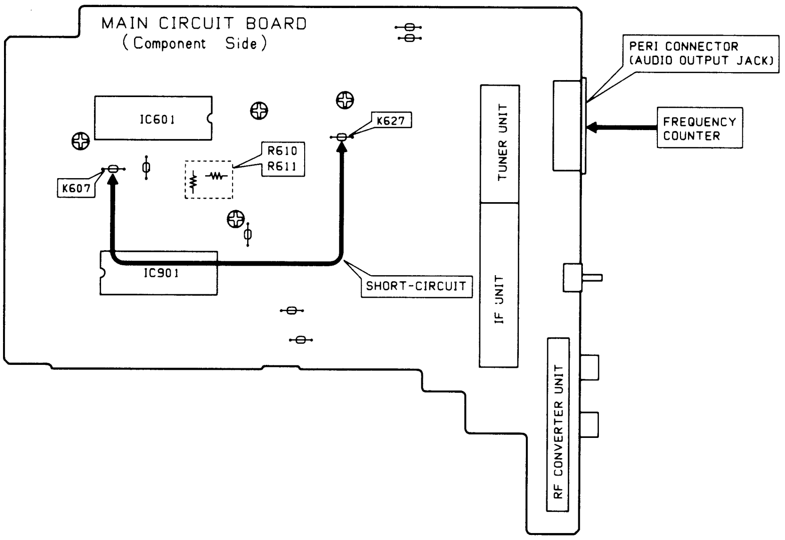
Purpose of adjustment and fault occurring if incomplete

Purpose: Fine tune the reference oscillation frequency (REF25 Hz) in the phase control loop to correct variations in diameters of flywheel, pulley, etc.

Fault: ○ Noise appears in picture.
○ Tracking cannot be optimized.

Test Equipment/Jigs	Test Equipment Connection Points	VTR State	Adjustment point
● Frequency counter ● Alignment tape	● Audio output jack	Alignment tape: Play back 3 kHz portion	● R610 (4.7K) ● R611 (3.9K)

Connection Diagram


MAIN CIRCUIT BOARD
(Component Side)
IC601
R610
R611
K627
K607
IC901
SHORT-CIRCUIT
TUNER UNIT
IF UNIT
RF CONVERTER UNIT
PERI CONNECTOR
(AUDIO OUTPUT JACK)
FREQUENCY
COUNTER

Adjustment Procedure

Readings on frequency counter
3000 Hz ±15 Hz : Adjustment unnecessary
3015 Hz or higher : Remove R611
2085 Hz or lower : Remove R610

Note: There are some units in which R610 or R611 is removed when shipped from the factory.

2. Switching Point Adjustment

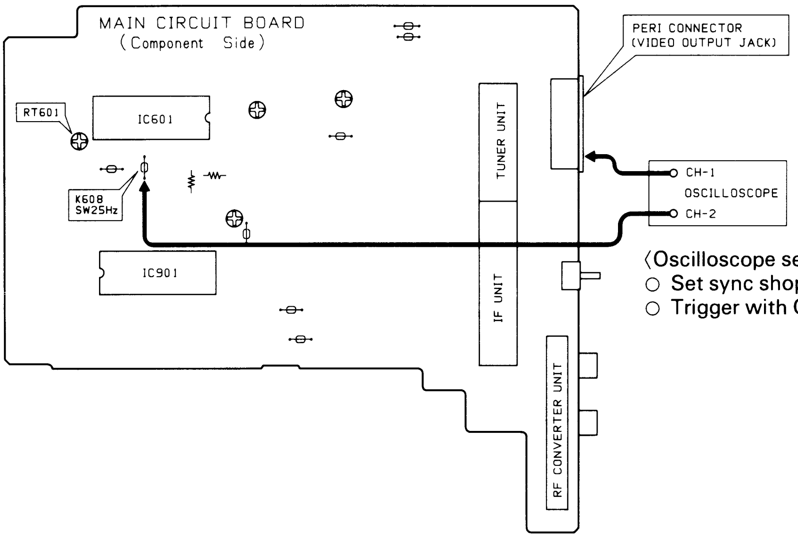
Purpose of adjustment and fault occurring if incomplete

Purpose: Set the video head switching point to almost centre where the CH-1 and CH-2 envelopes overlap each other during playback.

Fault: ○ The vertical sync signal is degraded and vertical jitter occurs.
○ Switching noise occurs in lower part of picture.

Test Equipment/Jigs	Test Equipment Connection Points	VTR State	Adjustment Point
● Oscilloscope ● Alignment tape	● CH-1: video output jack ● CH-2: K608	● Play back alignment tape	● RT601

Connection Diagram

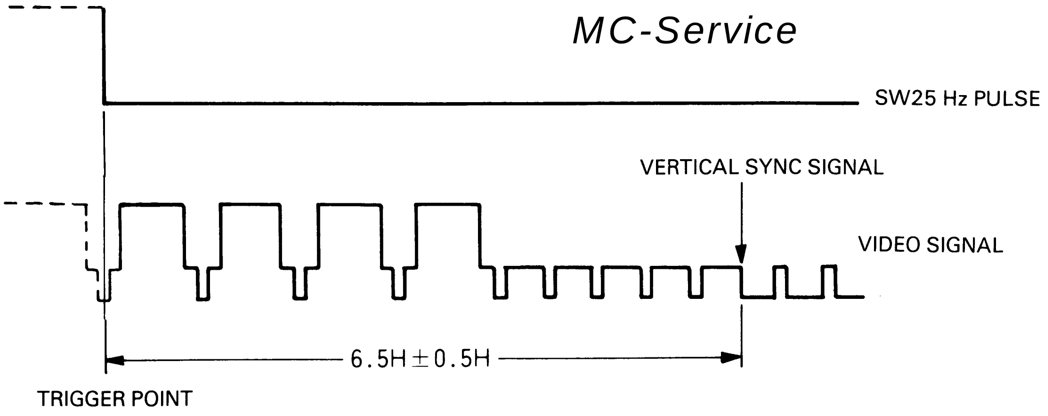

MAIN CIRCUIT BOARD
(Component Side)
RT601
IC601
K608
SW25Hz
IC901
TUNER UNIT
IF UNIT
RF CONVERTER UNIT
PERI CONNECTOR
(VIDEO OUTPUT JACK)
CH-1
OSCILLOSCOPE
CH-2

〈Oscilloscope settings〉
○ Set sync shope switch to "–"
○ Trigger with CH-2

Adjustment Procedure

Vertical sync signal:
6.5H ±0.5H from trailing edge (trigger point) of SW25 Hz pulse.

Waveform


SW25 Hz PULSE
VERTICAL SYNC SIGNAL
VIDEO SIGNAL
6.5H±0.5H
TRIGGER POINT

3. Tracking Preset Adjustment

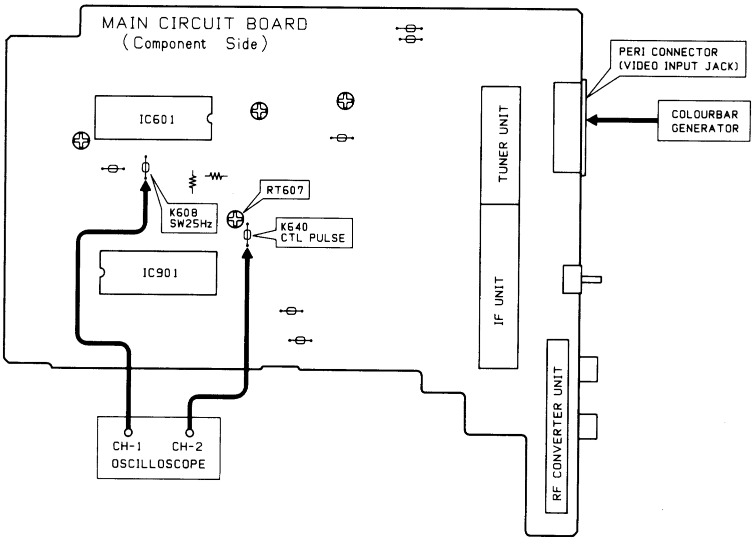
Purpose of adjustment and fault occurring if incomplete

Purpose: Optimize tracking when playing back a tape recorded by this unit.

Fault: ○ Noise occurs even with tracking control centred.
○ Noise cannot be removed by turning the tracking control.

Test Equipment/Jigs	Test Equipment Connection Points	VTR State	Adjustment Point
● Oscilloscope ● Colour bar generator (or receive TV programme) ● Blank tape	● CH-1: K608 ● CH-2: K640	● Record colour bar signal and play it back with this unit.	● RT607

Connection Diagram

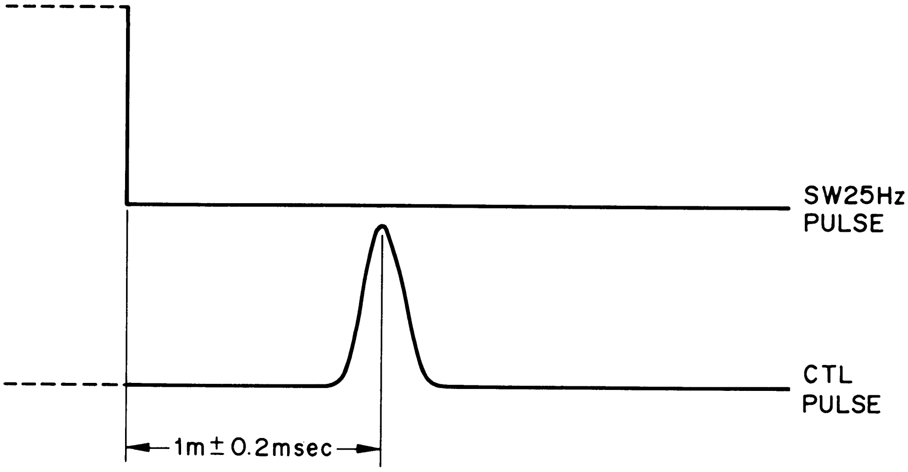

MAIN CIRCUIT BOARD
(Component Side)
PERI CONNECTOR (VIDEO INPUT JACK)
COLOURBAR GENERATOR
IC601
TUNER UNIT
RT607
K608 SW25Hz
K640 CTL PULSE
IC901
IF UNIT
RF CONVERTER UNIT
CH-1
CH-2
OSCILLOSCOPE

Adjustment Procedure

1) Tracking control: centred

2) It is 1 ± 0.2 ms from the fall of SW 25 Hz to the peak of CTL pulse.

Waveform


SW25Hz PULSE
CTL PULSE
1m±0.2msec

4. V Jitter Adjustment

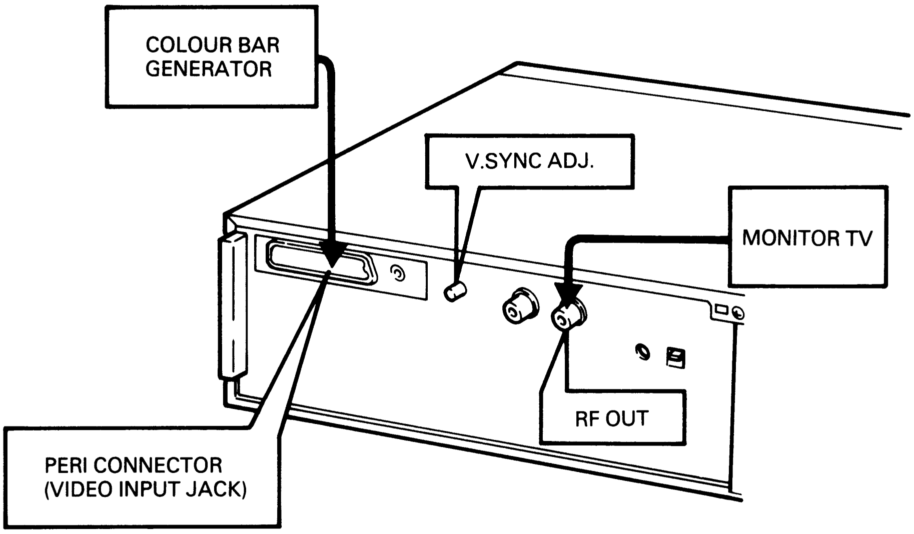
Purpose of adjustment and fault occurring if incomplete

Purpose: Change timing for adding vertical drive pulse and suppress vertical jitter in picture during trick play.

Fault: Vertical jitter during trick play.

Test Equipment/Jigs	Test Equipment Connection Points	VTR State	Adjustment Point
● Monitor TV ● Colour bar generator (or receive TV programme) ● Blank tape	● Check with monitor TV	● Record colour bar signal, play it back with this unit in F.ADV mode.	● RT501

Connection Diagram (Can be adjusted without removing any covers)


COLOUR BAR GENERATOR
V.SYNC ADJ.
MONITOR TV
RF OUT
PERI CONNECTOR (VIDEO INPUT JACK)

Adjustment Procedure

Suppress vertical jitter in picture.

2. AUDIO CIRCUIT ADJUSTMENTS

1. Audio Playback Level Adjustment

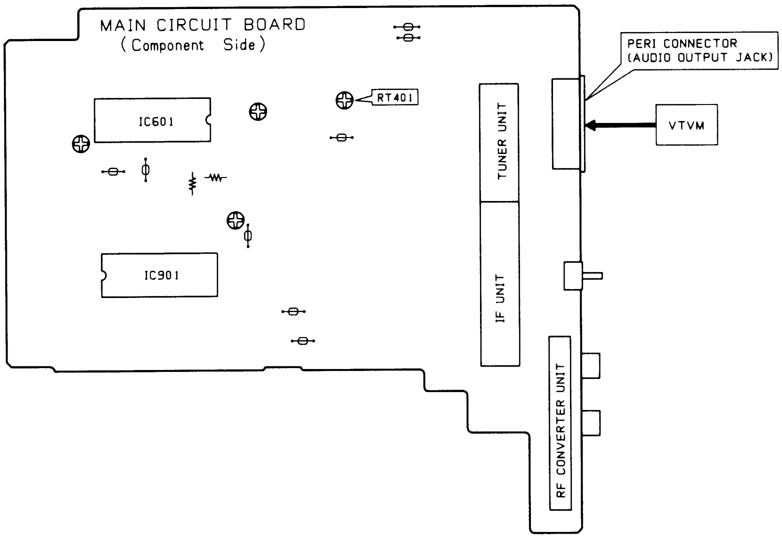
Purpose of adjustment and fault occurring if incomplete

Purpose: Set the audio playback level to the specified value.

Fault:

Test Equipment/Jigs	Test Equipment Connection Points	VTR State	Adjustment Point
● VTVM ● Alignment tape	● Audio output jack	● Play back alignment tape	● RT401

Connection Diagram


MAIN CIRCUIT BOARD
(Component Side)
IC601
RT401
IC901
TUNER UNIT
IF UNIT
RF CONVERTER UNIT
PERI CONNECTOR
(AUDIO OUTPUT JACK)
VTVM

Adjustment Procedure

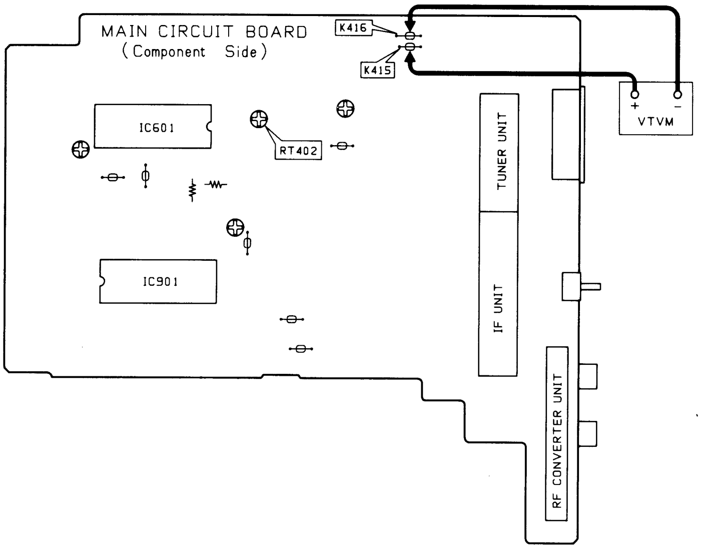
The VTVM reads −8 dBm +1 dBm

2. Audio Bias Level Adjustment

Purpose of adjustment and fault occurring if incomplete
Purpose: Set audio bias during recording to optimum level.
Fault: ○ Bias too deep: High-frequency response deteriorates.
○ Bias too shallow: Sound tends to be distorted.

Test Equipment/Jigs	Test Equipment Connection Points	VTR State	Adjustment Point
● VTVM ● Blank tape	● K415 ● K416	● Non-signal recording	● RT402

Connection Diagram



MAIN CIRCUIT BOARD
(Component Side)
K416
K415
+
-
VTVM
IC601
RT402
IC901
TUNER UNIT
IF UNIT
RF CONVERTER UNIT

Adjustment Procedure
The VTVM reads 2.3 mV ±0.1 mVrms.

MC-Service

3. Y/CHROMA CIRCUIT ADJUSTMENT

1. CCD Level Adjustment

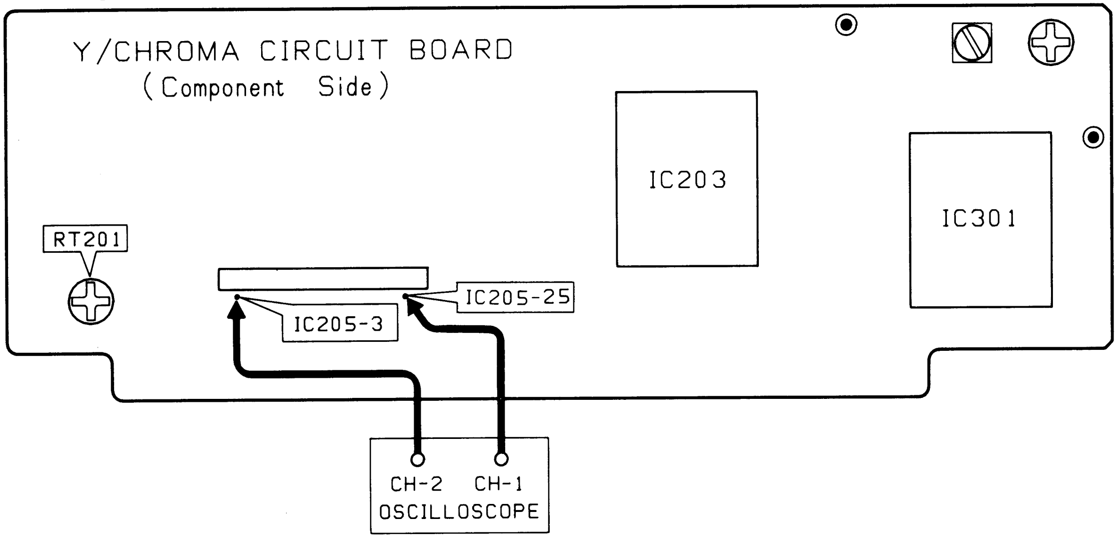
Purpose of adjustment and fault occurring if incomplete

Purpose:

Fault:

Test Equipment/Jigs	Test Equipment Connection Points	VTR State	Adjustment Point
● Oscilloscope ● Alignment tape	● CH-1: IC205-25 ● CH-2: IC205-3	● Play back alignment tape	● RT201

Connection Diagram


Y/CHROMA CIRCUIT BOARD
(Component Side)
IC203
IC301
RT201
IC205-25
IC205-3
CH-2
CH-1
OSCILLOSCOPE

Adjustment Procedure

Align the CH-1 and CH-2 levels.

CH-2 = CH-1$^{+0}_{-10}$mVp-p.

Note: CH-2 level is less than CH-1 level.

MC-Service

2. Secam Detect Level Adjustment

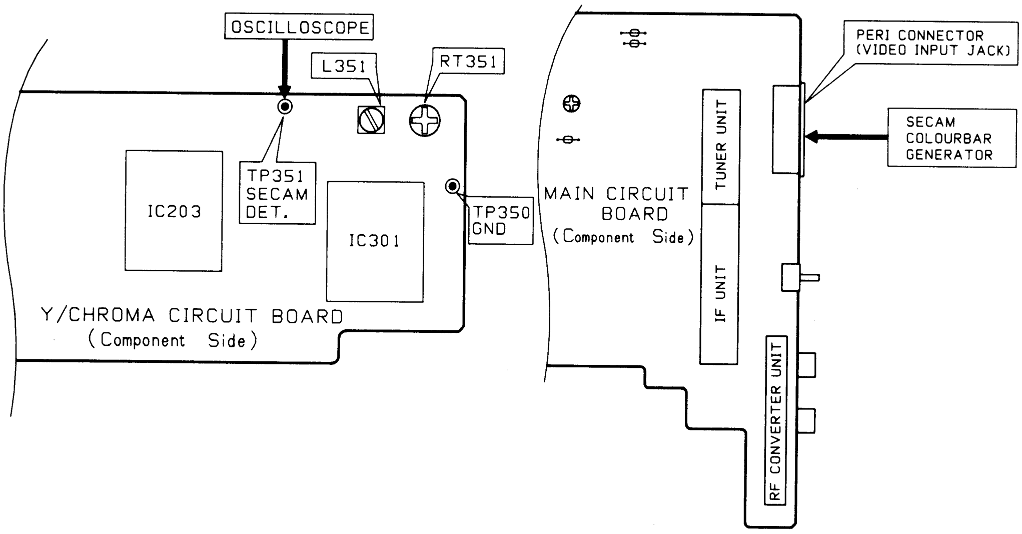
Purpose of adjustment and fault occurring if incomplete

Purpose:

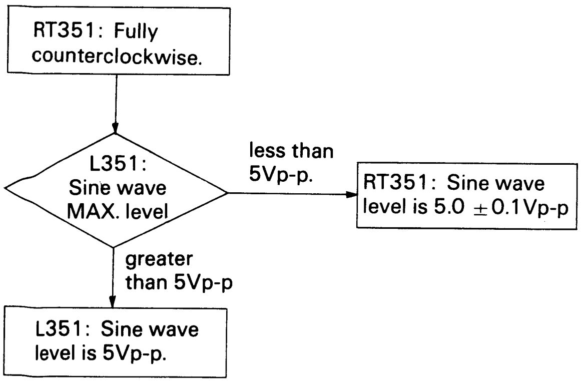
Fault:

Test Equipment/Jigs	Test Equipment Connection Points	VTR State	Adjustment Point
● SECAM colour bar generator ● Oscilloscope	● TP351 ● TP350 (GND)	● REC mode	● RT351

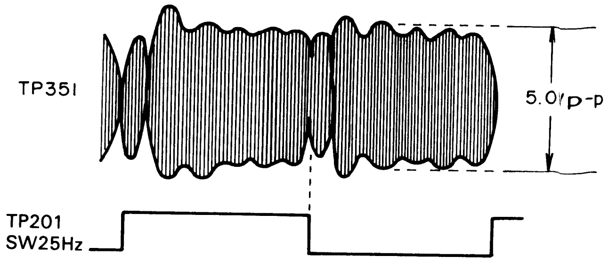
Connection Diagram


OSCILLOSCOPE
L351
RT351
TP351
SECAM
DET.
IC203
IC301
TP350
GND
Y/CHROMA CIRCUIT BOARD
(Component Side)
MAIN CIRCUIT
BOARD
(Component Side)
TUNER UNIT
IF UNIT
RF CONVERTER UNIT
PERI CONNECTOR
(VIDEO INPUT JACK)
SECAM
COLOURBAR
GENERATOR

Adjustment Procedure


RT351: Fully counterclockwise.
L351:
Sine wave
MAX. level
less than
5Vp-p.
RT351: Sine wave level is 5.0 ±0.1Vp-p
greater
than 5Vp-p
L351: Sine wave level is 5Vp-p.

Wave form


TP351
5.0Vp-p
TP201
SW25Hz

4. TIMER CIRCUIT ADJUSTMENTS

1. 4.19 MHz Crystal Adjustment

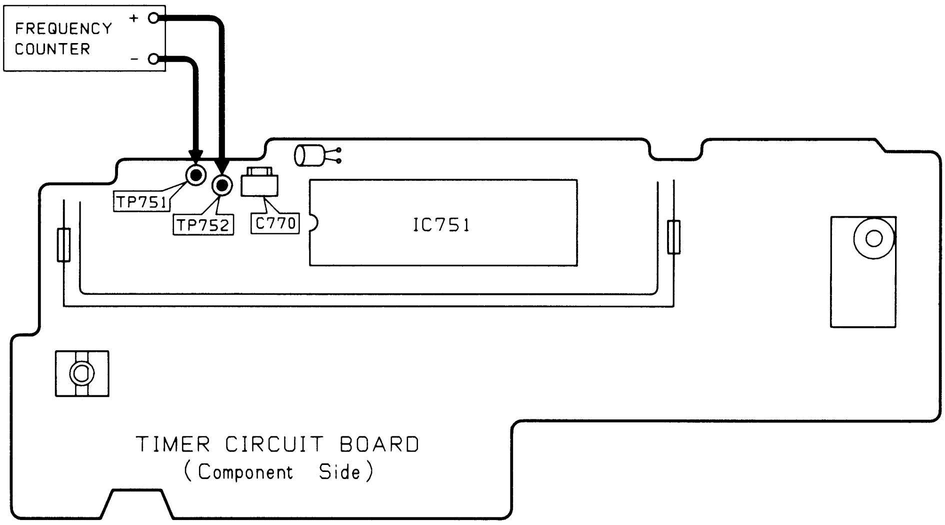
Purpose of adjustment and fault occurring if incomplete

Purpose: Suppress the time gain or lag of the timer less than 0.2 seconds per day.

Fault:

Test Equipment/Jig	Test Equipment Connection Points	VTR State	Adjustment Point
● Frequency counter	● TP751 (–) ● TP752 (+)	● Stop mode	● C770

Connection Diagram


FREQUENCY COUNTER
+
–
TP751
TP752
C770
IC751
TIMER CIRCUIT BOARD
(Component Side)

Adjustment Procedure

1) Set the counter gate time to 10 seconds.
2) The counter reads 4.1941902 MHz.

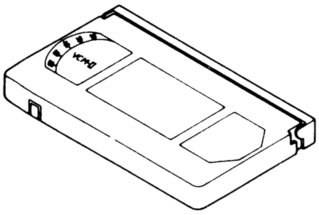
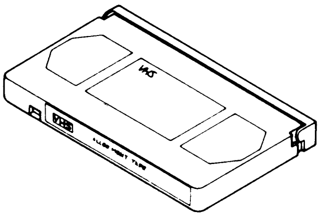
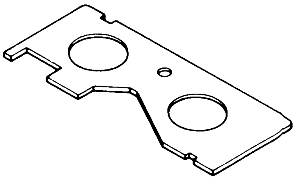
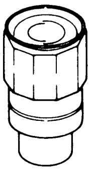
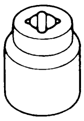
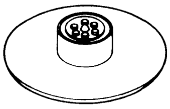
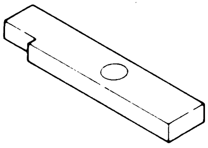
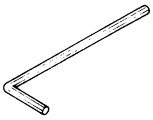
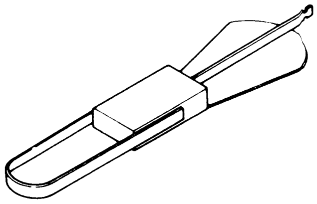
Note: Set the probe to 10 : 1 for use.

MC-Service

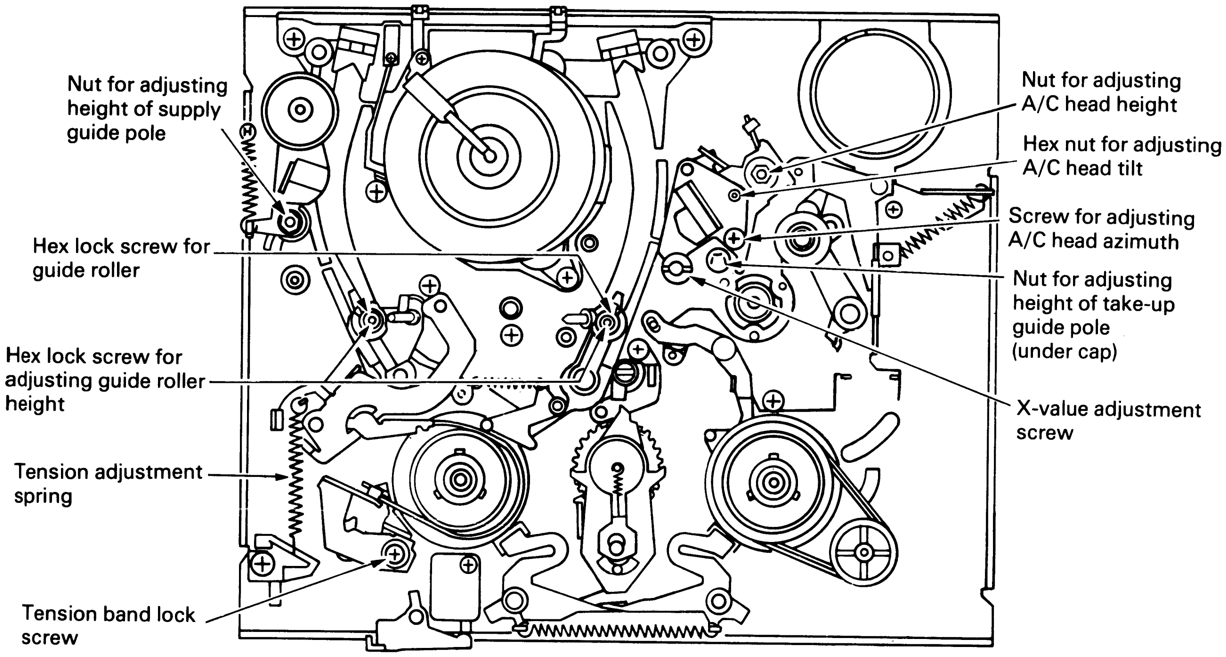
CHAPTER 4

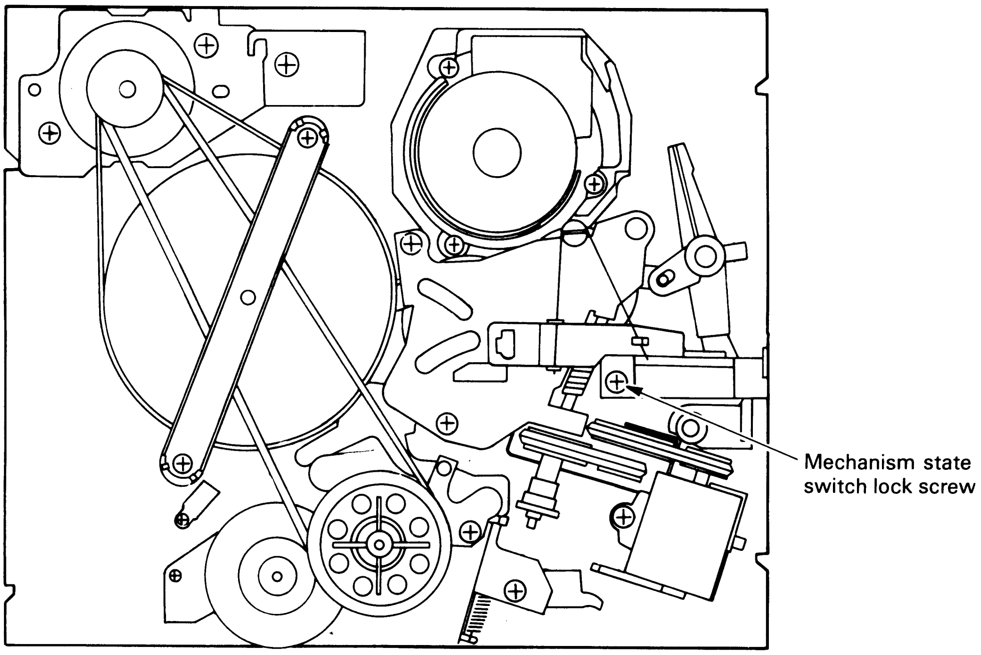
MECHANISM ADJUSTMENT

SERVICING JIGS AND TOOLS

1. Back tension meter Parts No. 7099004 	2. Alignment tape Parts No. 7099052 	3. Height reference plate (master plane) Parts No. 7099041 
4. Torque gauge Parts No. 7099039 	5. Torque gauge adaptor Parts No. 7099035 	6. Dummy reel Parts No. 7099043 
7. Reel disk height jig Parts No. 7099038 	8. 1.5 mm hexagonal wrench 	9. Fan-shaped tension gauge 

LIST OF ADJUSTMENT LOCATIONS


Nut for adjusting height of supply guide pole
Hex lock screw for guide roller
Hex lock screw for adjusting guide roller height
Tension adjustment spring
Tension band lock screw
Nut for adjusting A/C head height
Hex nut for adjusting A/C head tilt
Screw for adjusting A/C head azimuth
Nut for adjusting height of take-up guide pole (under cap)
X-value adjustment screw


Mechanism state switch lock screw

MECHANICAL COMPONENT ADJUSTMENT

1. Mechanism State Switch Adjustment

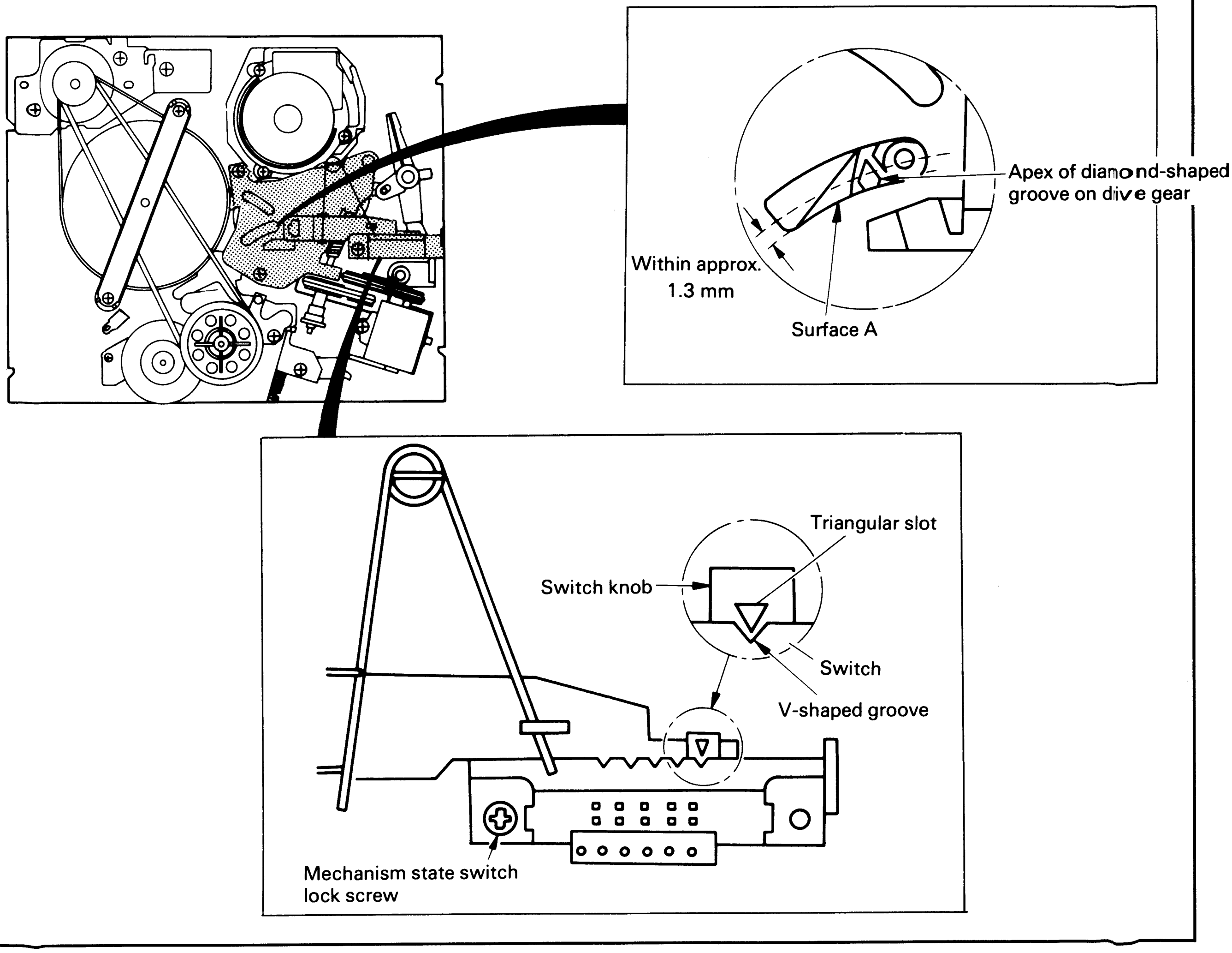
Purpose: Accurately detect mechanism states and prevent malfunction.

Test Equipment/Jigs	VTR State	Adjustment Point
● Blank tape	● Stop mode	● Mechanism state switch lock screw

Adjustment Procedure

1) Turn the worm pulley by hand. Position the apex of the diamond-shaped groove on the drive gear so that it is within 1.3 mm from the A surface of the gear plate.
2) Loosen the lock screw on the mechanism state switch. Slide the switch so that the apex of the triangular slot on the switch knob is aligned with the V-shaped groove on the extreme outside of the switch.
3) Loosen the lock screw. Insert the blank tape in the cassette holder. Check to make sure that all unloading and loading operations are correct.

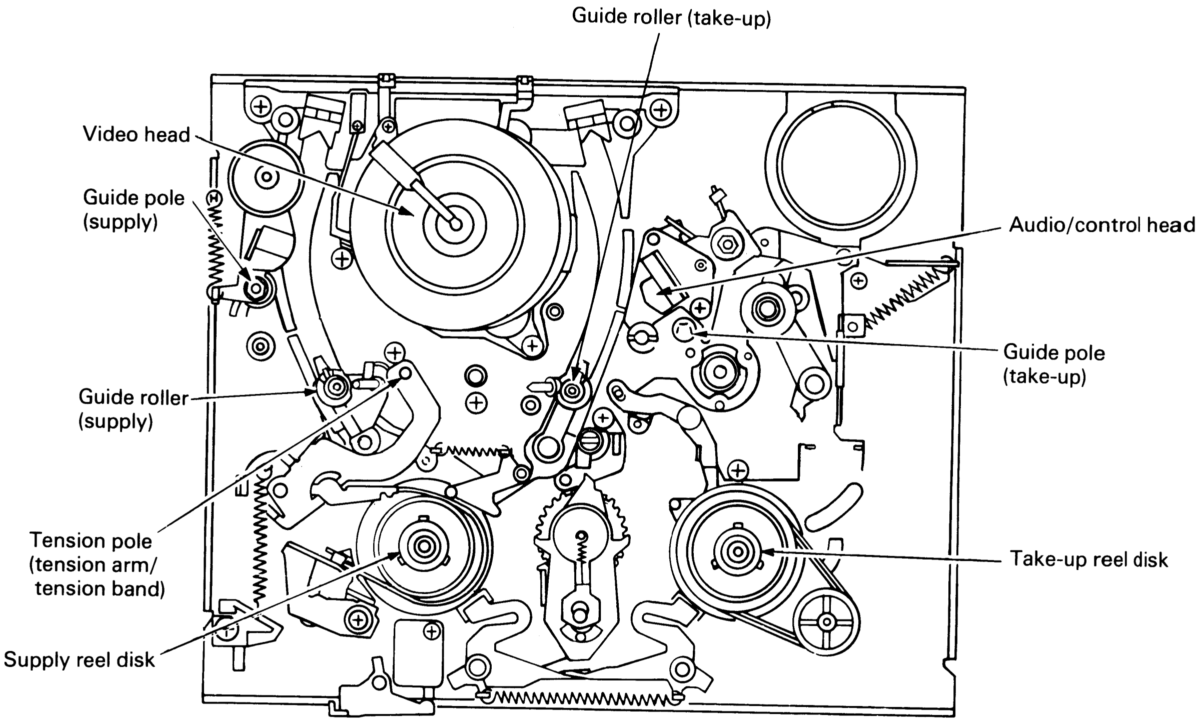
Adjustment Diagram


Apex of diamond-shaped groove on drive gear
Within approx. 1.3 mm
Surface A
Triangular slot
Switch knob
Switch
V-shaped groove
Mechanism state switch lock screw

TAPE TRANSPORT SYSTEM ADJUSTMENT

The transport system is the system in which tape moves from the supply reel disk, over the video head and then to the take-up reel disk. The components in the tape transport system must be perfectly clean, particularly those that come in contact with the tape.

These components must have no scratches, no dust, no oil on them. The tape transport system is adjusted at the factory prior to shipping. When components need to be replaced, accurately adjusting the new components ensures that the tape transport system will operate stably.


Guide roller (take-up)
Video head
Guide pole (supply)
Audio/control head
Guide pole (take-up)
Guide roller (supply)
Tension pole (tension arm/ tension band)
Take-up reel disk
Supply reel disk

Components Adjusted in Tape Transport System

1. Reel Disk Height Adjustment

Purpose: Determine correct tape height by setting cassette tape reel to the specified height.

Test Equipment/Jigs	VTR State	Adjustment Point
- Master plane - Reel disk height jig	1) Remove chassis holder 2) Mount master plane and place reel disk height jig on it.	- Spacers in supply and take-up reel disks.

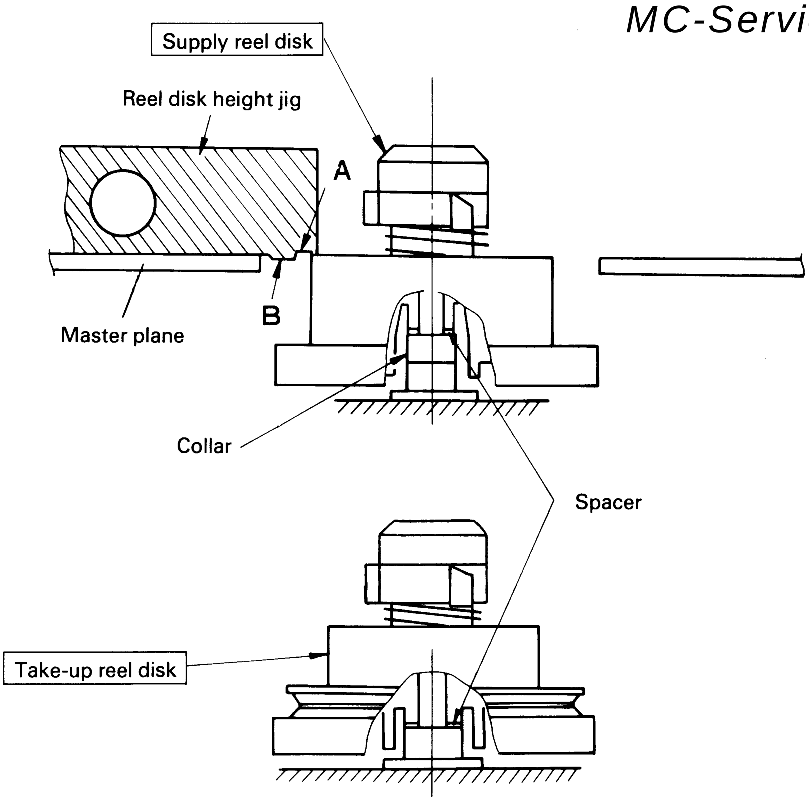
Adjustment Procedure

1) Make sure the reel disk is correctly positioned between points A and B on the reel disk height jig.
2) If the reel disk will not fit between points A and B, replace the spacer in the reel disk or adjust the number of spacers (0.25 mm and 0.5 mm thicknesses).

Caution:

If the tension arm/tension band have been removed, adjust the tension pole's position and tension after reassembling.

Adjustment Diagram


Supply reel disk
Reel disk height jig
A
B
Master plane
Collar
Spacer
Take-up reel disk

2. Tension/Tension Pole Position Adjustments

Purpose: Stabilize contact between video head and tape being supplied so that the tape tension is uniform throughout.

Test Equipment/Jigs	VTR State	Adjustment Point
● Flat-bladed screwdriver ● Tension cassette	1) Remove top cover 2) Place VTR in loading state without cassette insertion (see 4-17). **Tension adjustment** 3) Play tension cassette	**Position adjustment:** Tension band lock screw **Tension:** Tension spring hook position

Adjustment Procedure

Position Adjustment

1) Loosen lock screw on tension band. Insert flat bladed screwdriver in slot in bracket and chassis.
2) Use the screwdriver to slide the bracket for a 1 ~ 2 mm interval between the tension pole and chassis.
3) Tighten the lock screw on the tension band.
4) After adjusting, reload without inserting the tape and recheck the position of the tension pole.

Tension Adjustment

Reading of tension cassette:

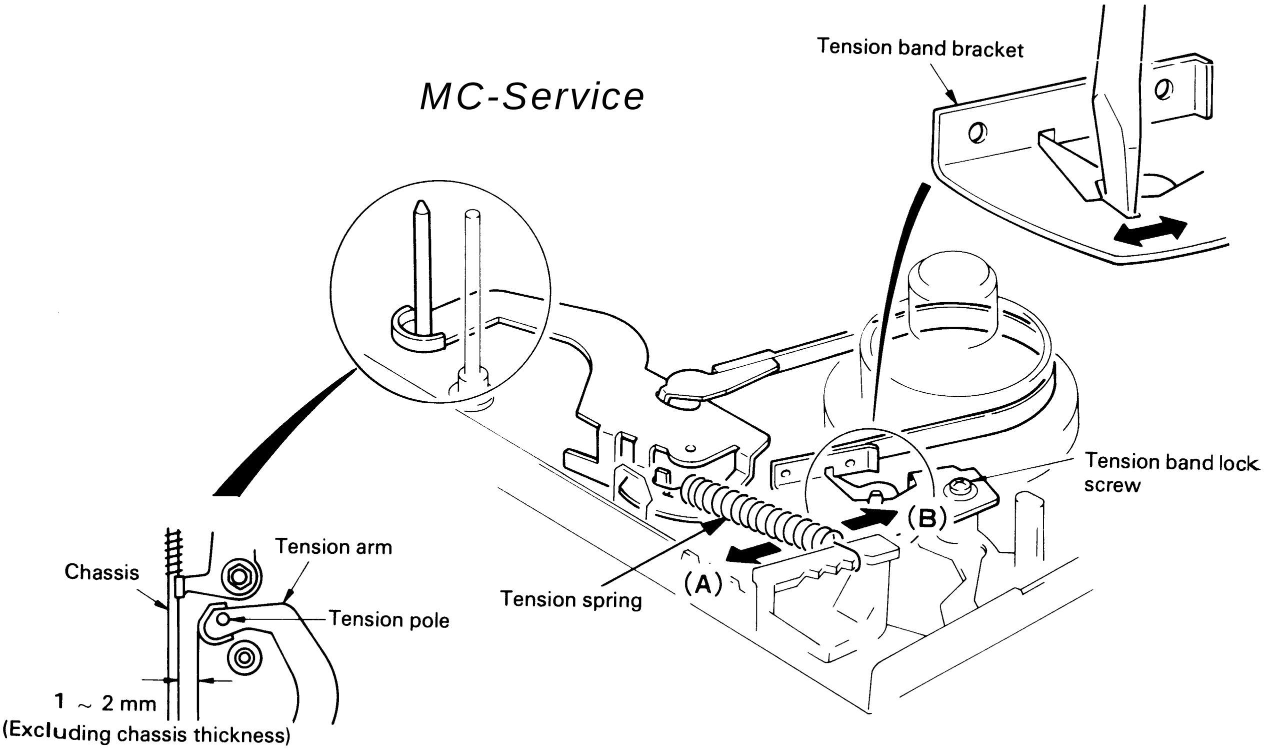
30 ~ 40 g-cm. (reference value)

If tension is higher than the reference value, move the spring in direction A.

If tension is lower than the reference value, move the spring in direction B.

Caution: If a 6 g-cm or larger change is made in tension position, recheck tension pole position. If the position is off, readjust the tension pole's position and tension.

Adjustment Diagram



3. Guide Pole Height Adjustment

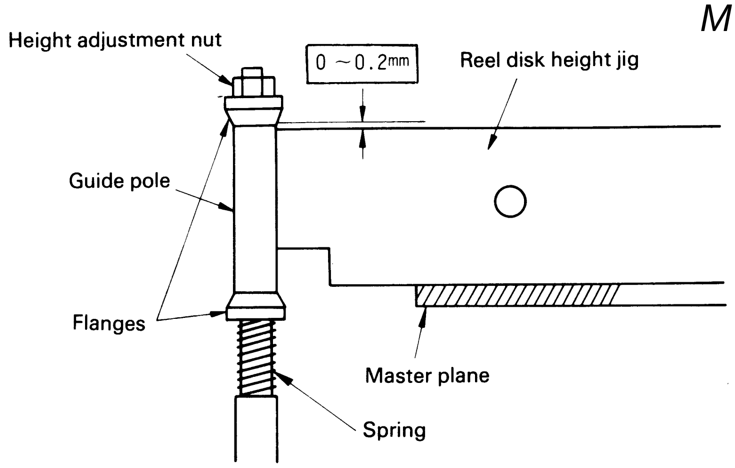
Purpose: Control tape height.

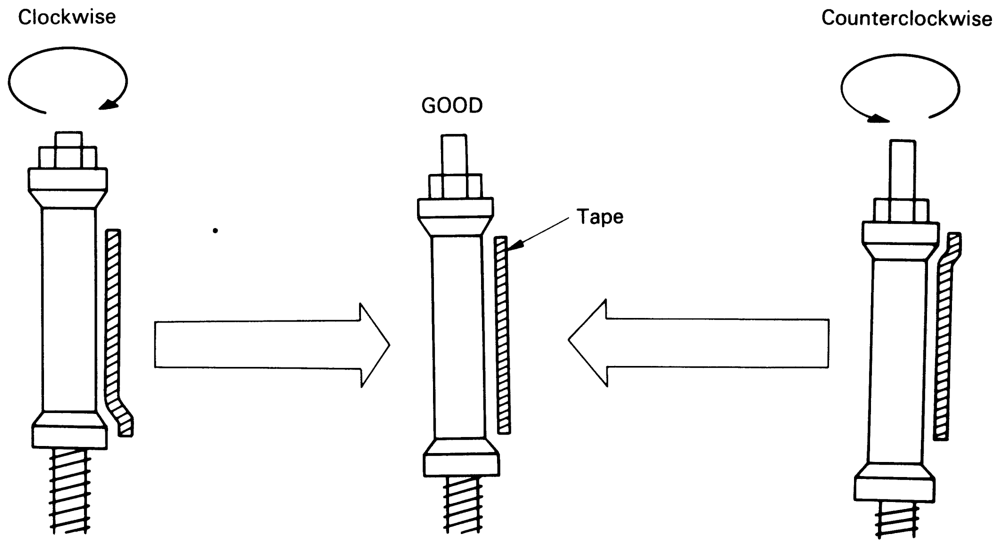
Test Equipment/Jigs	VTR State	Adjustment Point
● Master plane ● Reel disk height jig ● Blank tape	1) Remove chassis holder 2) Mount master plane and place the reel disk height jig on it.	● Nut for adjusting height of supply and take-up guide poles (take-up pole is under cap).

Adjustment Procedure

1) Adjust gap between guide pole's upper flange and reel disk height jig to 0 ~ 0.2 mm.
2) Load and run the blank tape. Check to make sure the tape does not ride over the pole's upper or lower flange.
3) If the tape does ride over, adjust guide pole height. If tape rides over upper flange, turn adjustment nut counterclockwise. If tape rides over lower flange, turn adjustment nut clockwise.

Adjustment Diagram


Height adjustment nut
0 ~ 0.2mm
Reel disk height jig
Guide pole
Flanges
Master plane
Spring


Clockwise
GOOD
Tape
Counterclockwise

4. Guide Roller Height Adjustments

Purpose: Control tape height so the tape's bottom edge runs along the cylinder's tape guideline.

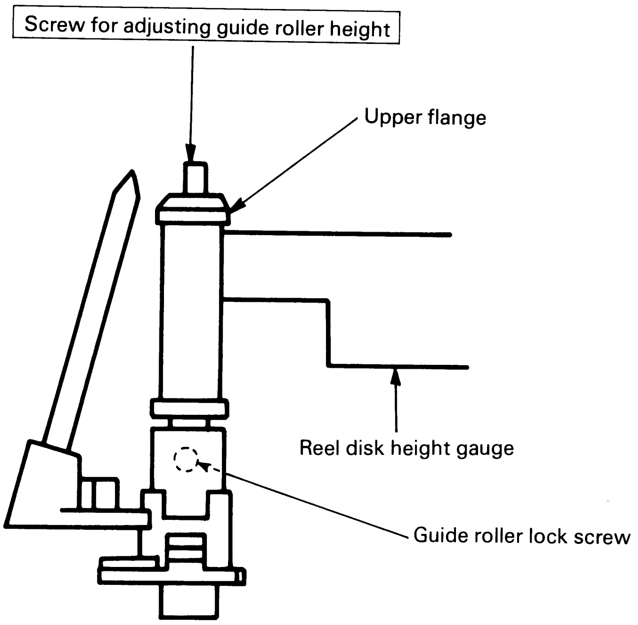
Coarse Adjustment

Test Equipment/Jigs	VTR State	Adjustment Point
● Master plane ● Reel disk height jig ● 1.5 mm hexagonal wrench	1) Remove chassis holder 2) Mount master plane and place reel disk height jig on it.	● Screws for adjusting height of supply and take-up guide roller

Adjustment Procedure

1) Loosen guide roller lock screw so that the guide roller does not turn during loading, unloading and playback.
2) Set the upper edge of the reel disk height jig to the same level as the guide roller's upper flange.
3) Now make precision adjustments.

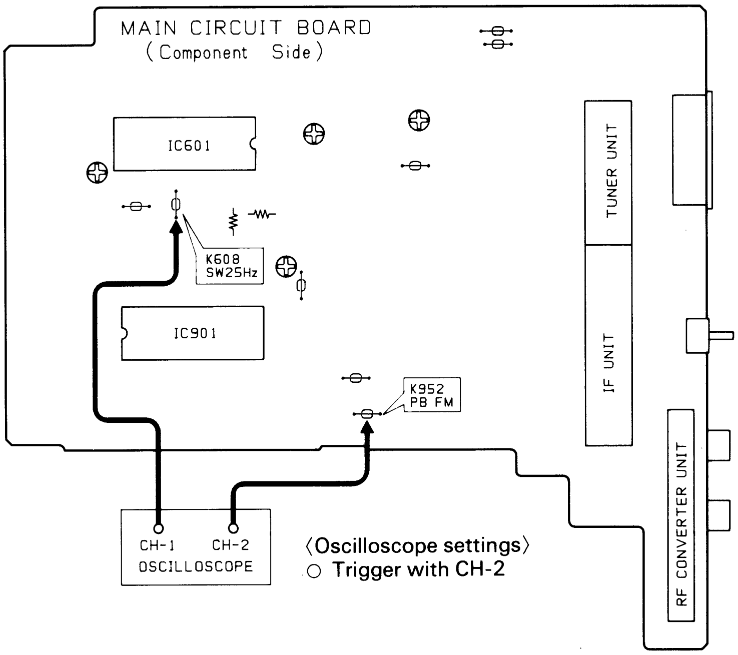
Adjustment Diagram


Screw for adjusting guide roller height
Upper flange
Reel disk height gauge
Guide roller lock screw

Precision Adjustment

Test Equipment/Jigs	Test Equipment Connection Point	VTR State	Adjustment Point
● Oscilloscope ● Alignment tape ● Hexagonal wrench	● CH-1: K952 ● CH-2: K608	● Playback alignment tape	● Screw for adjusting guide roller height

Connection Diagram

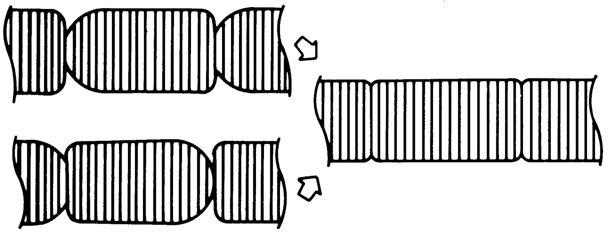

MAIN CIRCUIT BOARD
(Component Side)
IC601
K608
SW25Hz
IC901
K952
PB FM
TUNER UNIT
IF UNIT
RF CONVERTER UNIT
CH-1
CH-2
OSCILLOSCOPE

〈Oscilloscope settings〉
○ Trigger with CH-2

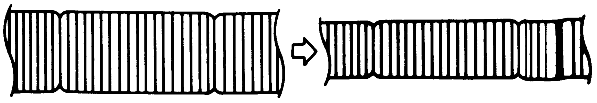
Adjustment Procedure

1) Tracking control: centered (when making this adjustment after replacing the cylinder, set the tracking control so the FM output is maximum.
2) Turn height adjustment screw to flatten the FM waveform.
3) Turn the tracking control clockwise.
4) Make sure that FM drops at the head and tail.
5) Tighten lock screw.

Waveform



Turn guide roller height adjustment screw a little at a time to flatten waveform.

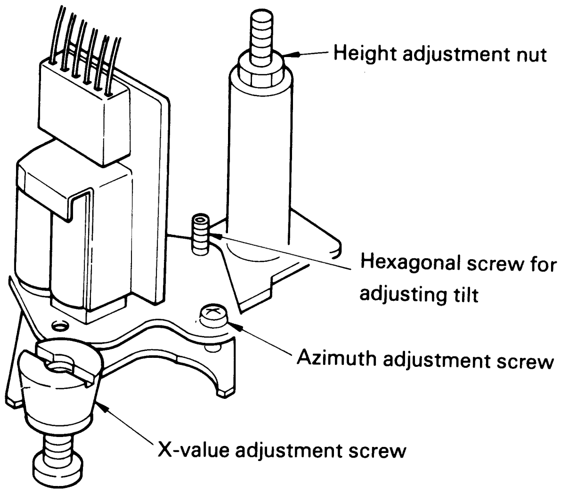


Tracking control centred

Turn tracking control clockwise

5. Audio and Control Head

Purpose: Ensure uniform contact between tape and head to record and play a prescribed track.


Height adjustment nut
Hexagonal screw for adjusting tilt
Azimuth adjustment screw
X-value adjustment screw

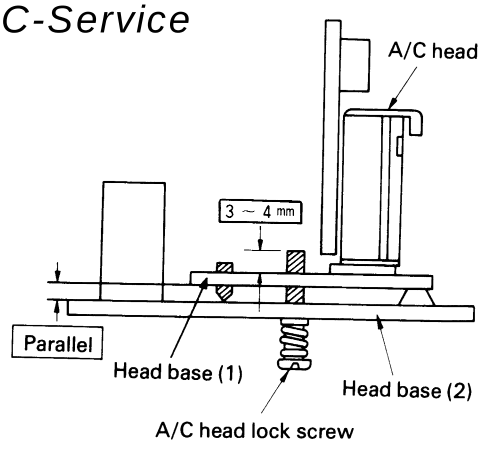
Coarse Adjustment

Test Equipment/Jigs	VTR State	Adjustment Point
● Master plane ● Reel disk height jig ● Blank tape ● Hexagonal wrench	1) Remove chassis holder 2) Mount master plane and place reel disk height jig on it.	● Azimuith adjustment screw ● Height adjustment nut ● Tilt adjustment screw

Adjustment Procedure

1) Tighten the A/C head lock screw through the spring from the bottom of head base (2) until the screw tip protrudes 3 ~ 4 mm from the top surface of head base (1).
2) Turn the tilt adjustment hexagonal screw and the azimuth adjustment screw so that head base (1) and head base (2) are parallel.

Adjustment Diagram


A/C head
3 ~ 4 mm
Parallel
Head base (1)
Head base (2)
A/C head lock screw

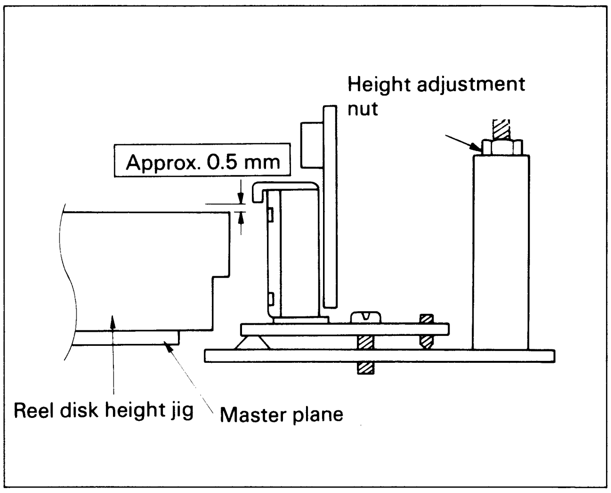
Adjustment Procedure

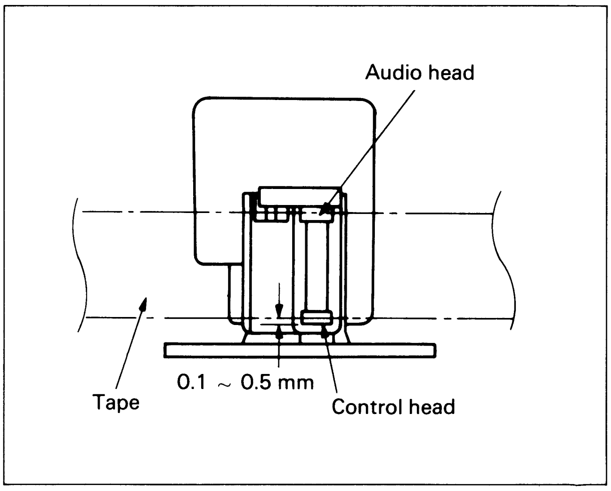
3) Turn the height adjustment nut until the gap between reel disk height jig and A/C head is approx. 0.5 mm.

4) Remove the adjustment jigs and insert a blank tape. Place in playback mode. Make sure the tape does not curl or ride over around the A/C head. If the tape curls or rides over, readjust the tilt adjustment hex screw, the azimuth adjustment screw and the height adjustment nut. The ideal A/C head height is with the tap's bottom edge 0.1 ~ 0.15 mm from the bottom edge of the control head's core.

5) Now move on to precision adjustments.

Adjustment Diagram





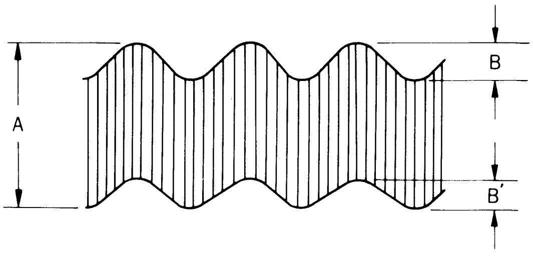
Precision Adjustment

Test Equipment/Jigs	Test Equipment Connection Point	VTR State	Adjustment Point
● Hexagonal wrench ● Oscilloscope ● Alignment tape	● Audio output jack	● Playback alignment tape (7 kHz portion)	● Azimuth adjustment screw ● Height adjustment nut ● Tilt adjustment screw

Adjustment Procedure

1) Alternate turning, a little at a time, of the azimuth adjustment screw, the height adjustment nut and the tilt adjustment hex screw to both maximize and flatten audio output (minimize fluctuation).

Waveform Diagram



A: maximum BB': minimum

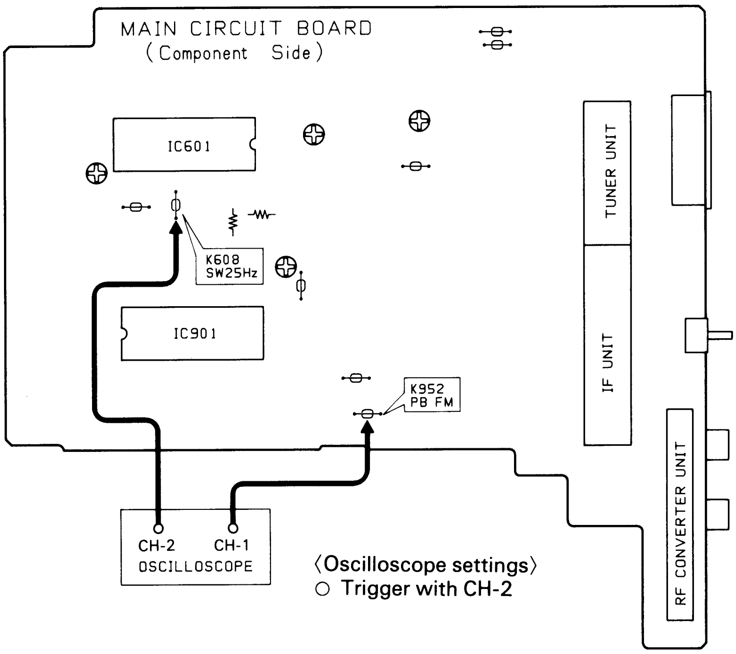
6. X Value Adjustment

Purpose: Ensure compatibility with other VTRs.

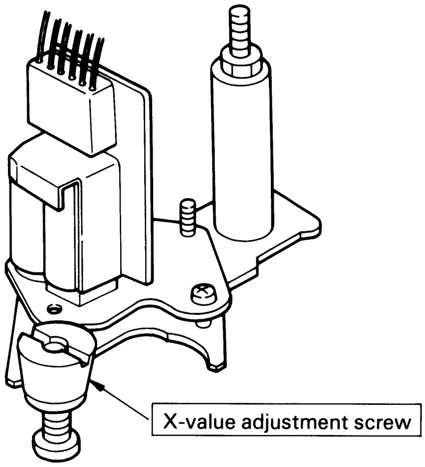
Caution: Be sure to adjust the tracking preset before making this adjustment.

Test Equipment/Jigs	Test Equipment Connection Point	VTR State	Adjustment Point
● Oscilloscope ● Alignment tape ● X-value adjustment screwdriver	● CH-1 : K952 ● CH-2 : K608	● Play back alignment tape	● X-value adjustment screw

Connections Diagram

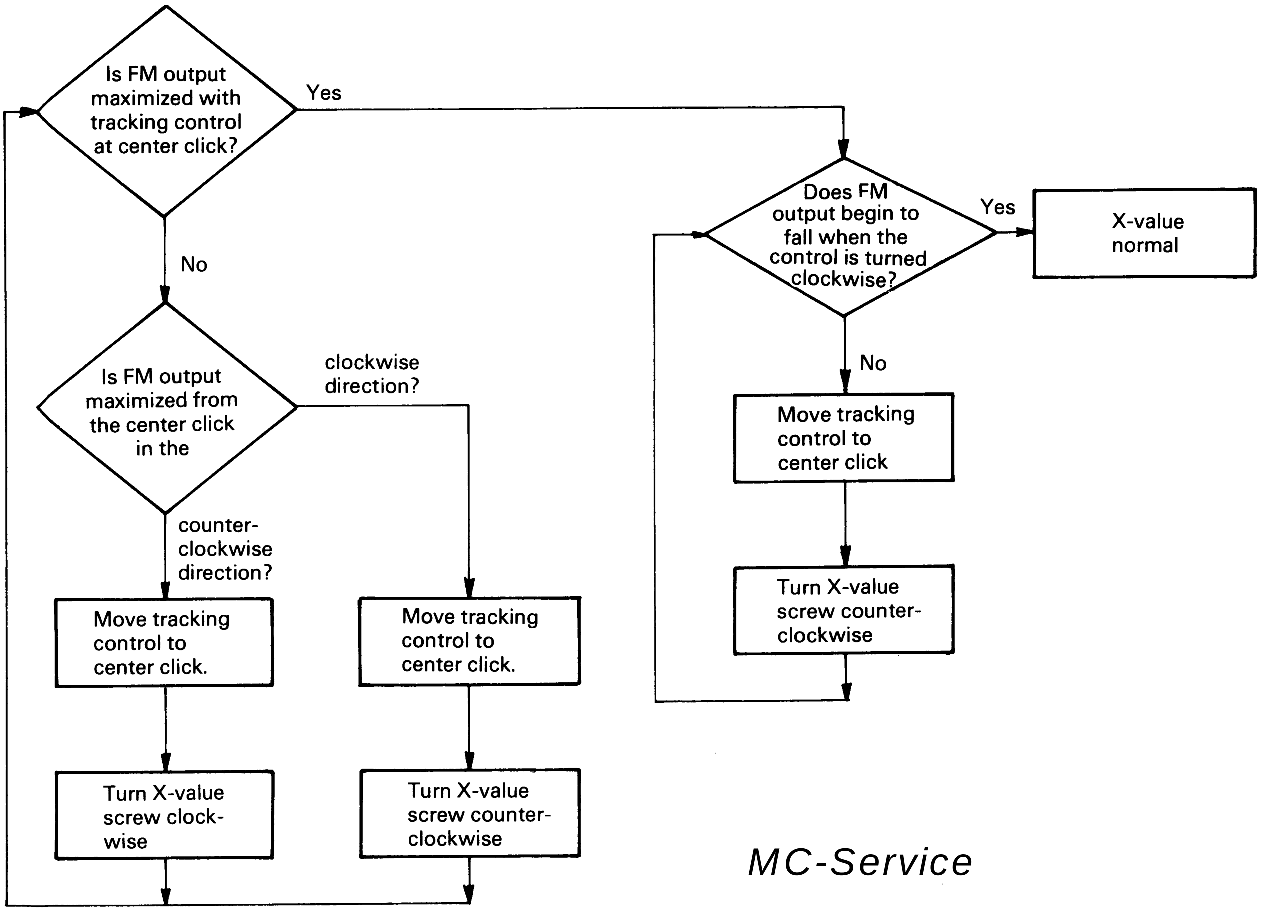

MAIN CIRCUIT BOARD
(Component Side)
IC601
K608
SW25Hz
IC901
K952
PB FM
TUNER UNIT
IF UNIT
RF CONVERTER UNIT
CH-2
CH-1
OSCILLOSCOPE

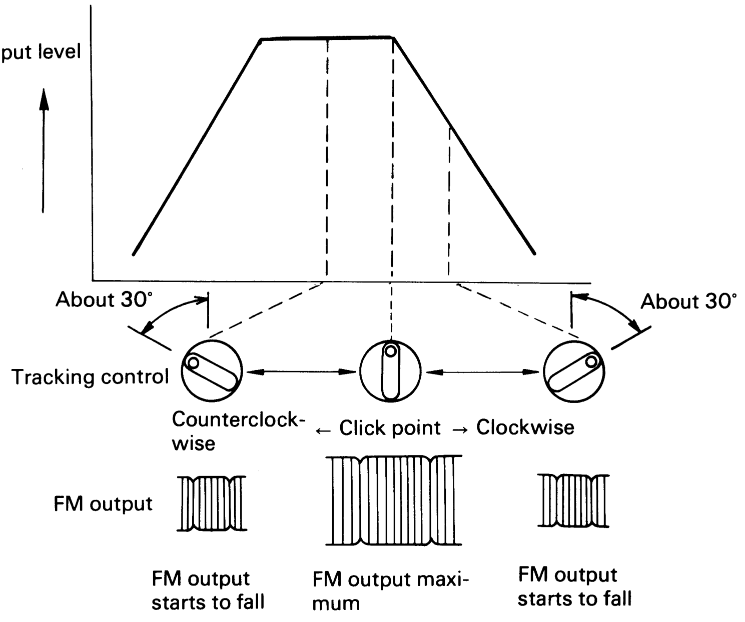
⟨Oscilloscope settings⟩
○ Trigger with CH-2


X-value adjustment screw

Adjustment Procedure

Since the 65 μm head will trace over 49 μm width track, center tracking control and make adjustments to maximize FM output, or turn the control clockwise about 30° and adjust so that FM output begins to fall. (Is FM output maximized with tracking control at center click?)


Is FM output maximized with tracking control at center click?
Yes
No
Is FM output maximized from the center click in the
clockwise direction?
counter-clockwise direction?
Move tracking control to center click.
Move tracking control to center click.
Turn X-value screw clockwise
Turn X-value screw counter-clockwise
Does FM output begin to fall when the control is turned clockwise?
Yes
X-value normal
No
Move tracking control to center click
Turn X-value screw counter-clockwise

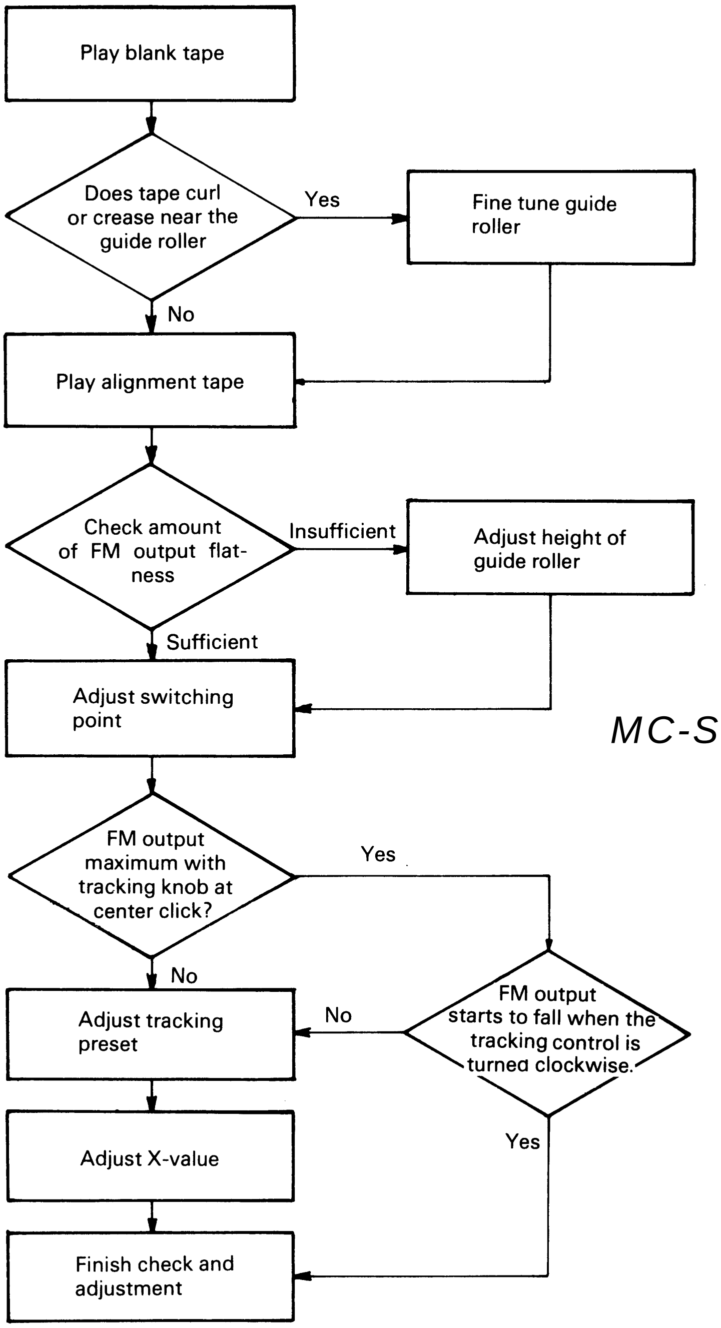

FM output level
About 30°
About 30°
Tracking control
Counterclockwise
← Click point → Clockwise
FM output
FM output starts to fall
FM output maximum
FM output starts to fall

7. Adjustments after replacing Cylinder (Video Head)

Purpose: A new replacement cylinder will differ with the guide roller in X-value and relative height. But, correct replacement procedures will reduce this disparity to a minimum.

Test Equipment/Jigs	Test Equipment Connection Points	Adjustment Points
● Oscilloscope ● Alignment tape ● Blank tape ● Hexagonal wrench ● X-value adjustment screwdriver	● Check amount of flattening ● CH-1 : K952 ● CH-2 : K608	● Guide roller (see precision adjustment on page 4-9) ● Switching point (see section 3) ● Tracking preset (see section 3) ● X-value (see page 4-12)

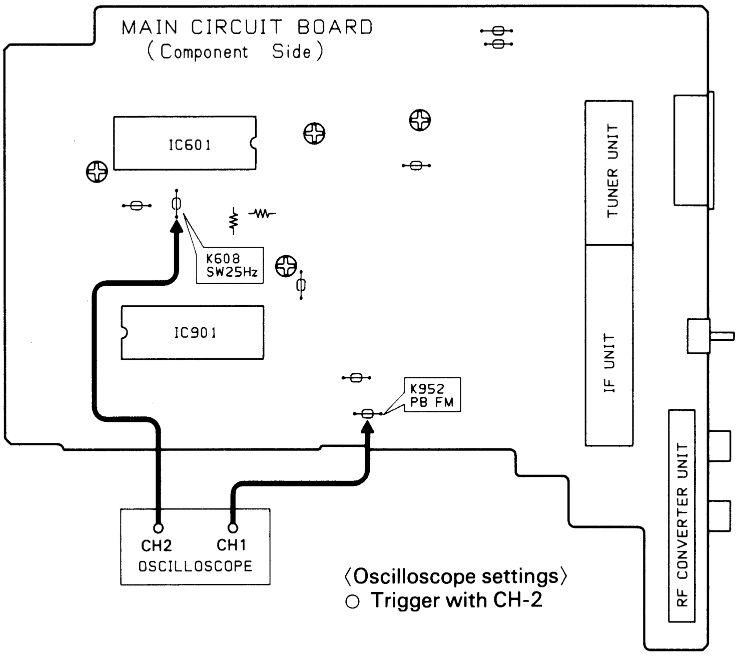
Check and Adjustment Procedures



Play blank tape
Does tape curl or crease near the guide roller
Yes
Fine tune guide roller
No
Play alignment tape
Check amount of FM output flatness
Insufficient
Adjust height of guide roller
Sufficient
Adjust switching point
FM output maximum with tracking knob at center click?
Yes
No
Adjust tracking preset
No
FM output starts to fall when the tracking control is turned clockwise.
Yes
Adjust X-value
Finish check and adjustment

MC-Service

Connection Diagram


MAIN CIRCUIT BOARD
(Component Side)
IC601
K608
SW25Hz
IC901
K952
PB FM
TUNER UNIT
IF UNIT
RF CONVERTER UNIT
CH2
CH1
OSCILLOSCOPE

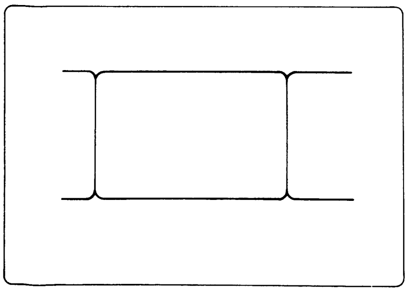
⟨Oscilloscope settings⟩
○ Trigger with CH-2

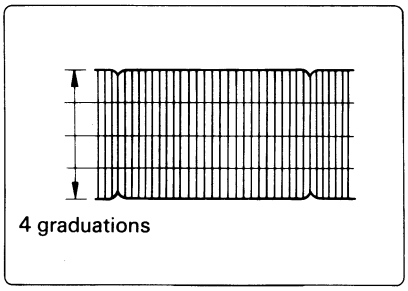
Procedures for checking amount of fluctuations and flatness in FM output

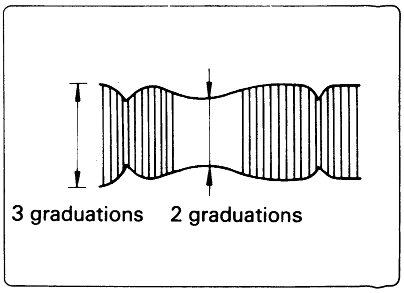
1) Use tracking control to maximize FM output.
2) Fine tune the oscilloscope's voltage level range to adjust FM output to 4 graduations.
3) Turn the tracking control to set the FM output's maximum amplitude at 3 graduations.
4) Make sure the minimum amplitude at this time is at 2 graduations or higher.
5) Make sure the difference between maximum and minimum level fluctuation is 13% or less.

Waveform Diagram

MC-Service




4 graduations


3 graduations
2 graduations

8. Checking Tension and Torque

Purpose: Checking tension torque and pressure on the components that wind and move the tape is necessary to ensure smooth tape run and fulfill the VTR's basic functions. Make this check when tape run is rough or tape speed is incorrect.

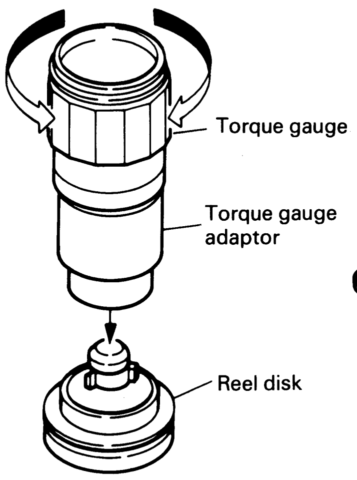
Test equipment/jigs	VTR state
● Torque gauge ● Torque gauge adaptor ● Fan-shaped tension gauge ● Dummy reel	● Operate VTR without loading tape cassette (see page 4-17)

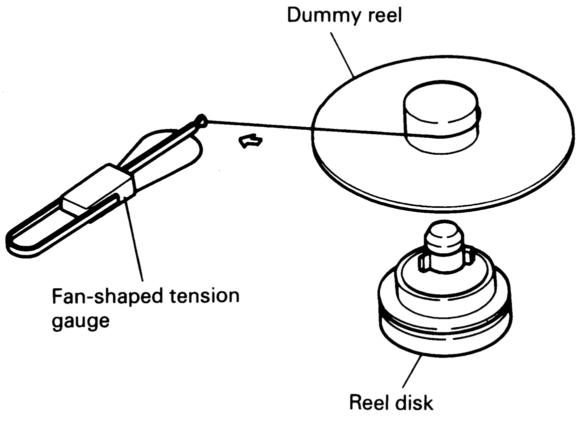
Item	VTR Operation mode	Measurement reel	Measurement values	Remarks
Main brake torque	Stop	Supply and take-up reels	170 g·cm or more	Note 1
Slack removal torque	Unloading	Supply reel	90 ~ 190 g·cm	Note 1
Fast forward torque	Fast forward	Take-up reel	400 g·cm or more	Note 1
Rewind torque	Rewind	Supply reel	400 g·cm or more	Note 1
Reel winding torque	Play	Take-up reel	90 ~ 180 g·cm	Note 1
Back-tension torque	Fast forward	Supply reel	4 ~ 15 g·cm	Note 2
	Rewind	Take-up reel		

Note: 1. Value when using torque gauge and torque gauge adaptor for measurement with torque gauge sliding at 0.8 rps. However, main brake torque indicates measurement values during manual rotation of take-up reel, counterclockwise, and supply reel, clockwise, at 0.8 rps.

Note: 2. Indicates the value when the dummy reel and fan-shaped tension gauge are used to measure the take-up reel disk pulling counterclockwise and the supply reel disk pulling clockwise at 50 mm/s.

Adjustment Diagram



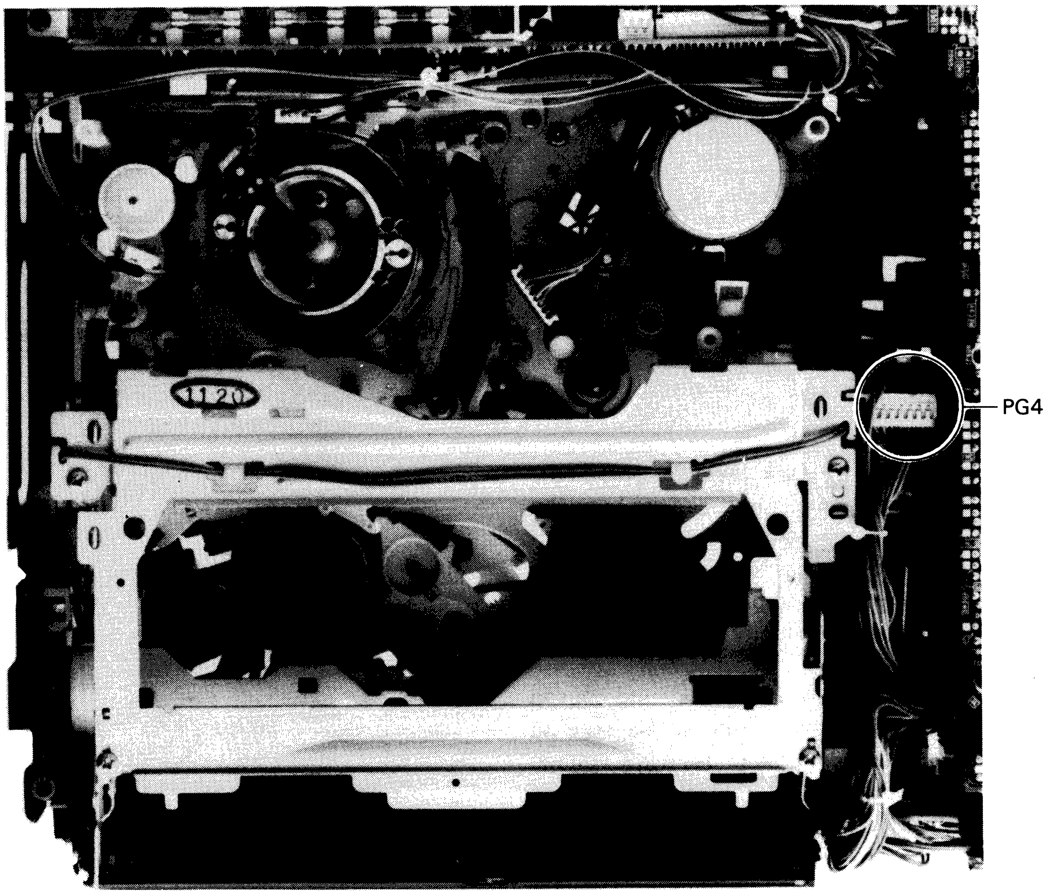


Note: Method with VTR in loading state and no tape cassette inserted.

1) Remove top cover.
2) Remove AC plug from wall socket.
3) Disconnect the connector from the plug (PG-4) on the cassette loading motor circuit board.
4) Short-circuit pins 2 and 5 of the connector.
5) Insert AC plug into wall socket.
6) Turn VTR power on.
   In this state, the VTR will accept all modes. However, rewind can be performed for only a few seconds because the take-up disk is in stop state and reel pulses cannot be detected.

[Caution]
After the above operations, always use the following steps to return to the original modes.

1) Remove short-circuit from connector and insert in plug.
2) Remove the AC plug from the wall socket once to reset the system control microprocessor.

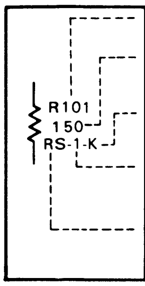


CHAPTER 5

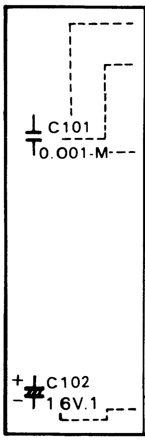
SCHEMATIC/CIRCUIT BOARD DIAGRAMS

Note

1. Voltage measured at base of chassis with minimum volume control and no signal.
   ( ) are shown in recording condition.
2. Nomenclature of Resistors and Capacitors.



	Circuit No.	
	Value	No indicated Ω (Ohm) M : 1000kΩ
	Tolerance	No indicated ±5% K: ±10% M: ±20%
	Wattage	No indicated ¼ W
	Sort	No indicated Carbon film RC : Composition RW : Wire wound RS : Oxide metal film RN : Fixed metal film

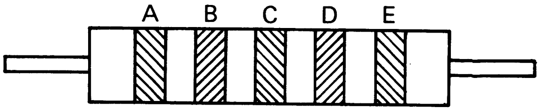


	Circuit No.		
	Value	No indicated μF P : PF	
	Tolerance	No indicated ±10% J : ± 5% M : ±20% Z : +80%, −20% D : ±0.5pF C : ±0.25pF	
	Sort	⊥⊤	Ceramic
		+⊥⊤−	Electrolitic
		M⊥⊤	Mylar
		P⊥⊤	Polyester
		S⊥⊤	Styrol
	Voltage	No indicated 50WV	

3. Be sure to make your orders of resistors and capacitors with value, voltage, tolerance and sort.
4. When replacing capacitors marked with * use specified ones stated on parts list since required temperature characteristics.

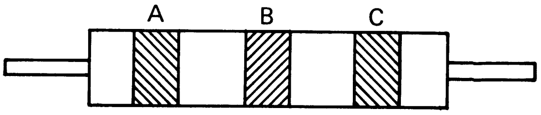
HOW TO READ CAPACITY AND INDUCTANCE OF RESISTOR SHAPE CAPACITORS AND COILS

CAPACITOR



CAPACITY: (10A+B)xC [PF]
TOLERANCE: D
RATED VOLTAGE: BODY COLOR
Pink: 25V
Green: 50V
CHARACTERISTICS: E

COIL



INDUCTANCE: (10A+B)xC [μH]

COLOR	A, B	C	D	E
Black	0	10^0	±20%	For temperature compensation
Brown	1	10^1		
Red	2	10^2		
Orange	3	10^3		
Yellow	4	10^4		
Green	5	10^5		
Blue	6			
Violet	7			
Grey	8		±30%	High dielectric constant type
White	9			For temperature compensation
Gold		10^{-1}	± 5%	
Silver		10^{-2}	±10%	High dielectric constant type

Cautions on use of MOS IC

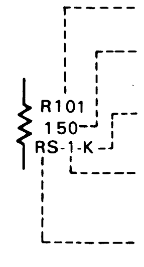
1. The MOS IC is inserted in black foam for shipment. This foam is a conductor which short-circuits between the leads to prevent damage. Do not remove ICs from this foam during their storage. Avoid removing ICs from this foam, placing them on plastic which is likely to be charged with static electricity or inserting them into styrol foam.
2. High voltages may be applied during soldering caused by leakages from the soldering iron, so be sure to ground the tip of the soldering iron or use a low voltage soldering iron.
3. The human body, clothes made of synthetic fibres or nylon gloves may be charged with several thousands volts of static electricity because of friction, so a worker should be grounded.
4. Be sure to ground measuring instruments such as oscilloscopes, VTVMs, etc. used for repairs.

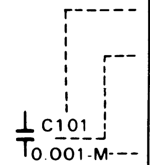
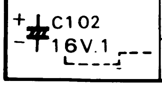
KAPITEL 5

SCHALTPLAN/LEITERPLATTEN-DIAGRAMM

Hinweise:

1. Die aufgeführten Spannungswerte wurden bei auf Minimum gestelltem Lautstärkeregler und ohne Signal gemessen. Die in Klammern ( ) gestellten Werte gelten für den Aufnahmemodus.
2. Bezeichnung der Widerstände und Kondensatoren

	Schaltkreis-Nr.	
	Wert	Keine Angabe: Ohm M: 1000 kOhm
	Toleranz	Keine Angabe: ± 5% K: ±10% M: ±20%
	Wattzahl	Keine Angabe: 1/4W
	Bauart	Keine Angabe: Kohlefilm RC: Verbundbauweise RW: Drahtspule RS: Metalloxidfilm RN: Fester Metallfilm

	Schaltkreis-Nr.		
	Wert	Keine Angabe: µF P : PF	
	Toleranz	Keine Angabe: ±10% J : ± 5% M : ±20% Z : +80%, −20% D : ±0.5pF C : ±0.25pF	
	Bauart	┴┬	Keramik
		+┴┬	Electrolyt
		M ┴┬	Mylar
		P ┴┬	Polyester
		S ┴┬	Styrol
	Spannung	Keine Angabe: 50V	

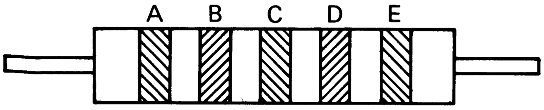
3. Bei der Bestellung von Widerständen und Kondensatoren unbedingt Wert, Spannung und Bauart angeben.
4. Werden die mit "*" markierten Kondensatoren ausgetauscht, dann müssen due in der Stückliste spezifizierten Kondensatoren verwendet werden, da diese spezielle Temperatureigenschaften aufweisen.

Vorsichtsmaßnahmen bei der Verwendung von MOS-ICs

1. Die MOC-ICs werden für den Versand in schwarzem Schaumstoff verpackt. Dieser Schaumstoff ist elektrisch leitend und schließt die Leiter kurz, um Beschädigungen zu vermeiden. Die ICs während der Lagerung niemals aus der Schaumstoffverpackung entfernen. Die ICs nur unmittelbar vor der Verwendung auspacken und niemals auf Plastikteilen ablegen (statische Elektrizität!) bzw. in Styrol-Schaumstoff einsetzen.
2. Aufgrund von Leckagen am Lötkolben kann es während des Lötens zu Hochspannungen kommen; daher immer die Spitze des Lötkolbens erden und nur einen Niederspannungs-Lötkolben verwenden.
3. Statische Elektrizität von einigen tausend Volt kann sich aufgrund von Reibung im menschlichen Körper bzw. in aus Kunstfasern hergestellten Kleidern und Handschuhen aufbauen. Daher sollten auch die mit der Handhabung von ICs betrauten Personen geerdet werden.
4. Unbedingt die für die Reparaturen verwendeten Meßinstrumente wie Oszilloskop, Röhrenvoltmeter usw. erden.

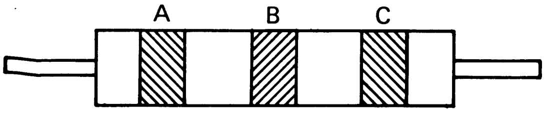
Ablesen der Kapazität und Induktivität der in Form von Widerständen ausgeführten Kondensatoren und Spulen

Kondensator



Kapazität: (10A+B)xC (pF)
Toleranz: D
Nennspannung: Farbe Rosa: 25V
Grün: 50V
Kennlinie: E

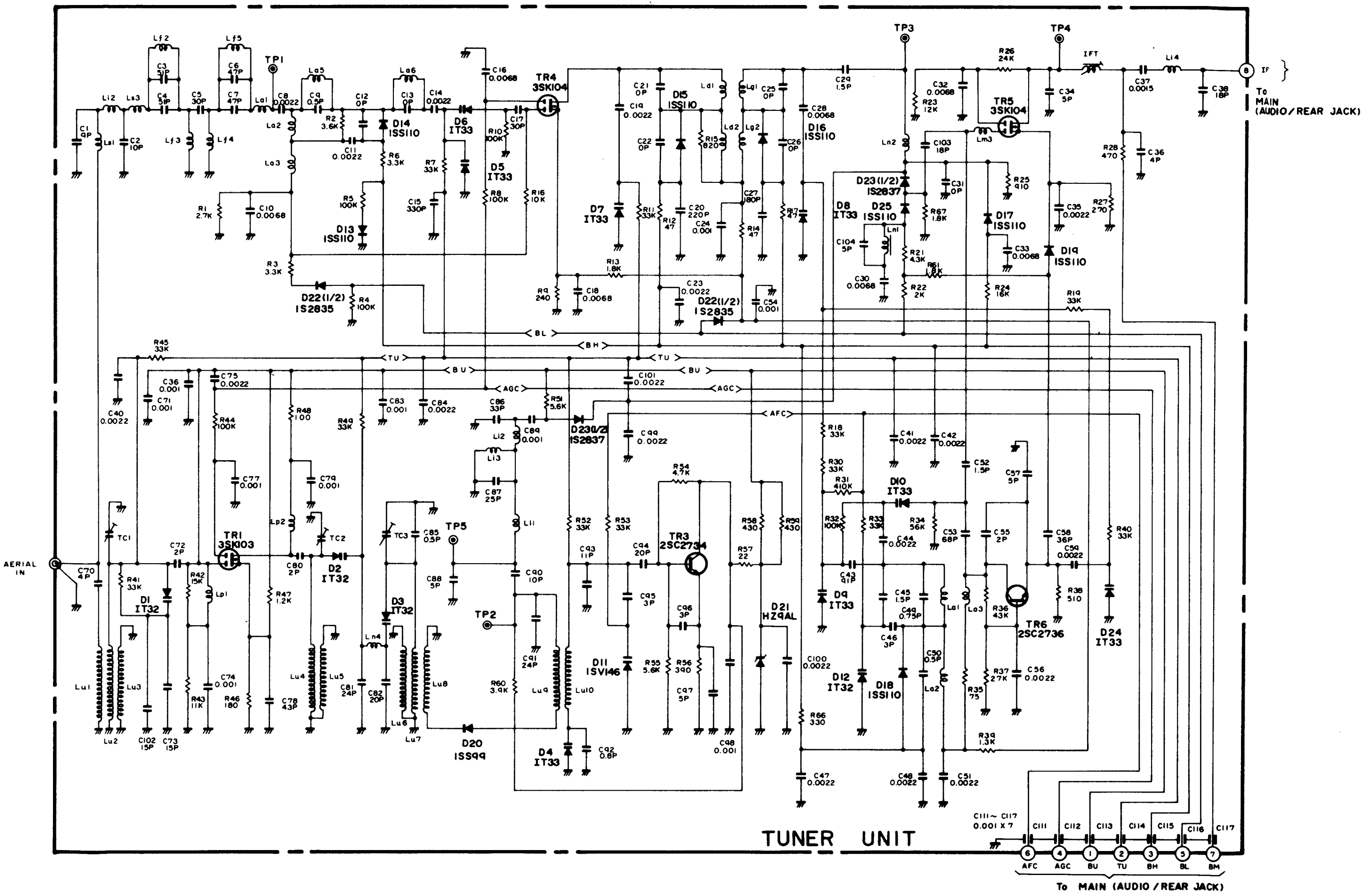
Spule



Induktivität: (10A+B)xC (µH)

Farbe	A, B	C	D	E
Schwarz	0	10^0	±20%	Für Temperature-Kompensation
Braun	1	10^1		
Rot	2	10^2		
Orange	3	10^3		
Gelb	4	10^4		
Grün	5	10^5		
Blau	6			
Violett	7			
Grau	8		±30%	Bauart mit hoher Dielektrizitätskonstanter
Weiß	9			Für Temperatur-Kompensation
Gold		10^{-1}	± 5%	
Silber		10^{-2}	±10%	Bauart mit hoher Dielektrizitätskonstanter

TUNER UNIT/(TUNER-EINHEIT)



AERIAL IN
TP1
TP2
TP3
TP4
TP5
TR1 3SK103
TR3 2SC2734
TR4 3SK104
TR5 3SK104
TR6 2SC2736
D1 IT32
D2 IT32
D3 IT32
D4 IT33
D5 IT33
D6 IT33
D7 IT33
D8 IT33
D9 IT33
D10 IT33
D11 1SV146
D12 IT32
D13 1SS110
D14 1SS110
D15 1SS110
D16 1SS110
D17 1SS110
D18 1SS110
D19 1SS110
D20 1SS99
D21 HZ9AL
D22(1/2) 1S2835
D23(1/2) 1S2837
D24 IT33
D25 1SS110
IFT
IF
To MAIN (AUDIO/REAR JACK)
AFC
AGC
BU
TU
BH
BL
BM
C111~C117 0.001 X 7
TUNER UNIT
To MAIN (AUDIO/REAR JACK)

SCHEMATIC DIAGRAM	PAGE

TUNER UNIT 5-2
IF UNIT 5-3
V·S TUNING 5-5
TIMER/OPERATION SWITCH
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TIMER/OPERATION SWITCH
- VT-120E - 5-14
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REMOTE CONTROL 5-24
AUDIO/REAR JACK 5-26
RF CONVERTER 5-29
PREAMP 5-30
SERVO 5-39
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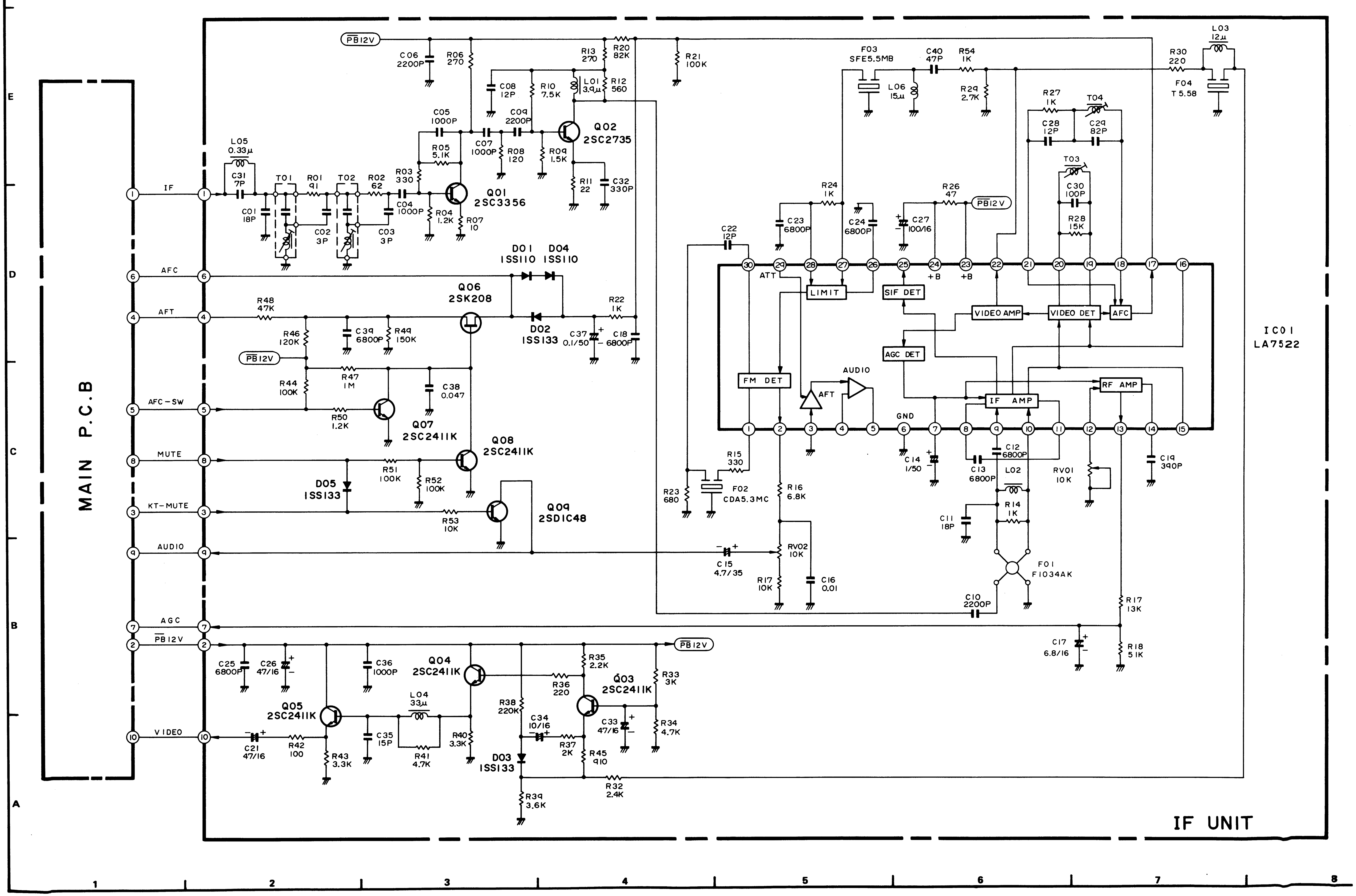
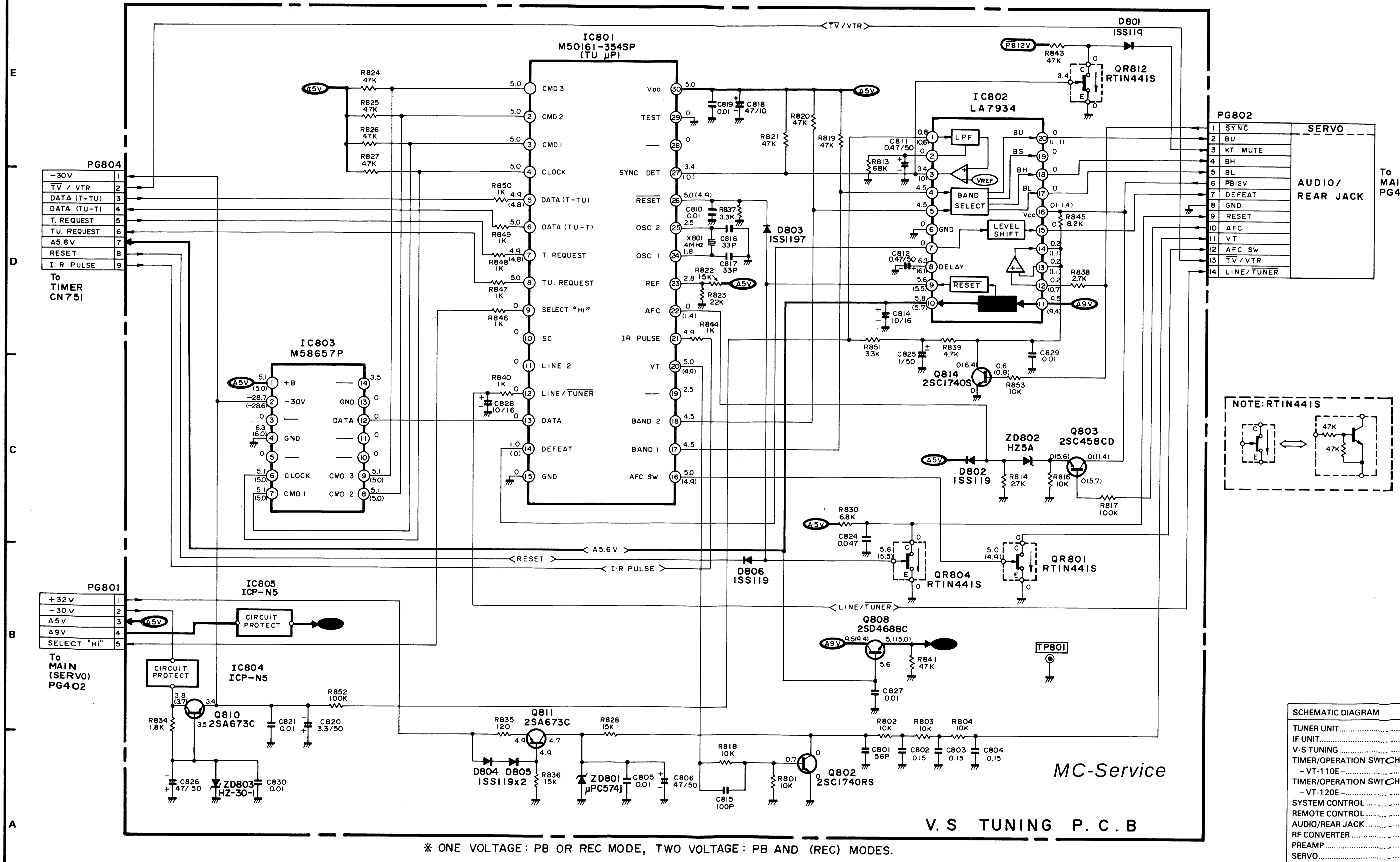
REGULATOR 5-51
INTERNAL WIRING DIAGRAM 5-55

IF UNIT (ZF-EINHEIT)


MAIN P.C.B
IF UNIT
IF
AFC
AFT
AFC-SW
MUTE
KT-MUTE
AUDIO
AGC
PB12V
VIDEO
L05 0.33μ
C31 7P
C01 18P
T01
R01 91
T02
C02 3P
R02 62
C03 3P
R03 330
C04 1000P
C05 1000P
R05 5.1K
R04 1.2K
R07 10
Q01 2SC3356
C06 2200P
R06 270
C08 12P
R10 7.5K
C07 1000P
R08 120
C09 2200P
R09 1.5K
Q02 2SC2735
R11 22
C32 330P
R13 270
R20 82K
L01 3.9μ
R12 560
R21 100K
D01 1SS110
D04 1SS110
Q06 2SK208
R48 47K
R46 120K
C39 6800P
R49 150K
D02 1SS133
R22 1K
C37 0.1/50
C18 6800P
R47 1M
R44 100K
C38 0.047
R50 1.2K
Q07 2SC2411K
Q08 2SC2411K
D05 1SS133
R51 100K
R52 100K
R53 10K
Q09 2SD1C48
C25 6800P
C26 47/16
C36 1000P
Q04 2SC2411K
R35 2.2K
R36 220
Q03 2SC2411K
R33 3K
Q05 2SC2411K
L04 33μ
C35 15P
R41 4.7K
R40 3.3K
R38 220K
C34 10/16
R37 2K
C33 47/16
R34 4.7K
R45 910
D03 1SS133
R39 3.6K
R32 2.4K
C21 47/16
R42 100
R43 3.3K
F03 SFE5.5MB
L06 15μ
C40 47P
R54 1K
R29 2.7K
R30 220
L03 12μ
F04 T5.58
R27 1K
T04
C28 12P
C29 82P
T03
C30 100P
R28 15K
R24 1K
R26 47
C23 6800P
C24 6800P
C27 100/16
C22 12P
ATT
LIMIT
SIF DET
+B
VIDEO AMP
VIDEO DET
AFC
AGC DET
AUDIO
FM DET
AFT
IF AMP
RF AMP
GND
IC01 LA7522
R15 330
R23 680
F02 CDA5.3MC
R16 6.8K
C14 1/50
C13 6800P
C12 6800P
L02
C11 18P
R14 1K
RV01 10K
C19 390P
C15 4.7/35
RV02 10K
R17 10K
C16 0.01
F01 F1034AK
C10 2200P
R17 13K
C17 6.8/16
R18 51K
E
D
C
B
A
1
2
3
4
5
6
7
8

V·S TUNING (SPANNUNGSSYNTHESIZER-TUNER)


IC801
M50161-354SP
(TU µP)
CMD 3
CMD 2
CMD 1
CLOCK
DATA (T-TU)
DATA (TU-T)
T. REQUEST
TU. REQUEST
SELECT "Hi"
SC
LINE 2
LINE / TUNER
DATA
DEFEAT
GND
VDD
TEST
SYNC DET
RESET
OSC 2
OSC 1
REF
AFC
IR PULSE
VT
BAND 2
BAND 1
AFC SW
IC802
LA7934
LPF
VREF
BAND SELECT
LEVEL SHIFT
DELAY
RESET
GND
Vcc
BU
BS
BH
BL
IC803
M58657P
+B
-30V
GND
DATA
CLOCK
CMD 3
CMD 1
CMD 2
PG804
-30V
TV / VTR
DATA (T-TU)
DATA (TU-T)
T. REQUEST
TU. REQUEST
A5.6V
RESET
I. R PULSE
To TIMER CN751
PG801
+32V
-30V
A5V
A9V
SELECT "Hi"
To MAIN (SERVO) PG402
PG802
SYNC
BU
KT MUTE
BH
BL
PB12V
DEFEAT
GND
RESET
AFC
VT
AFC SW
TV / VTR
LINE / TUNER
SERVO
AUDIO/ REAR JACK
To MAIN PG403
IC805 ICP-N5
CIRCUIT PROTECT
IC804 ICP-N5
Q810 2SA673C
Q811 2SA673C
Q802 2SC1740RS
Q803 2SC458CD
Q808 2SD468BC
Q814 2SC1740S
QR801 RTIN441S
QR804 RTIN441S
QR812 RTIN441S
D801 ISS119
D802 ISS119
D803 ISS1197
D804 D805 ISS119x2
D806 ISS119
ZD801 µPC574J
ZD802 HZ5A
ZD803 HZ-30-1
X801 4MHz
TP801
A5V
A9V
PB12V
TV / VTR
A5.6V
RESET
I·R PULSE
LINE / TUNER
NOTE: RTIN441S
47K
47K
V. S TUNING P. C. B

※ ONE VOLTAGE: PB OR REC MODE, TWO VOLTAGE: PB AND (REC) MODES.

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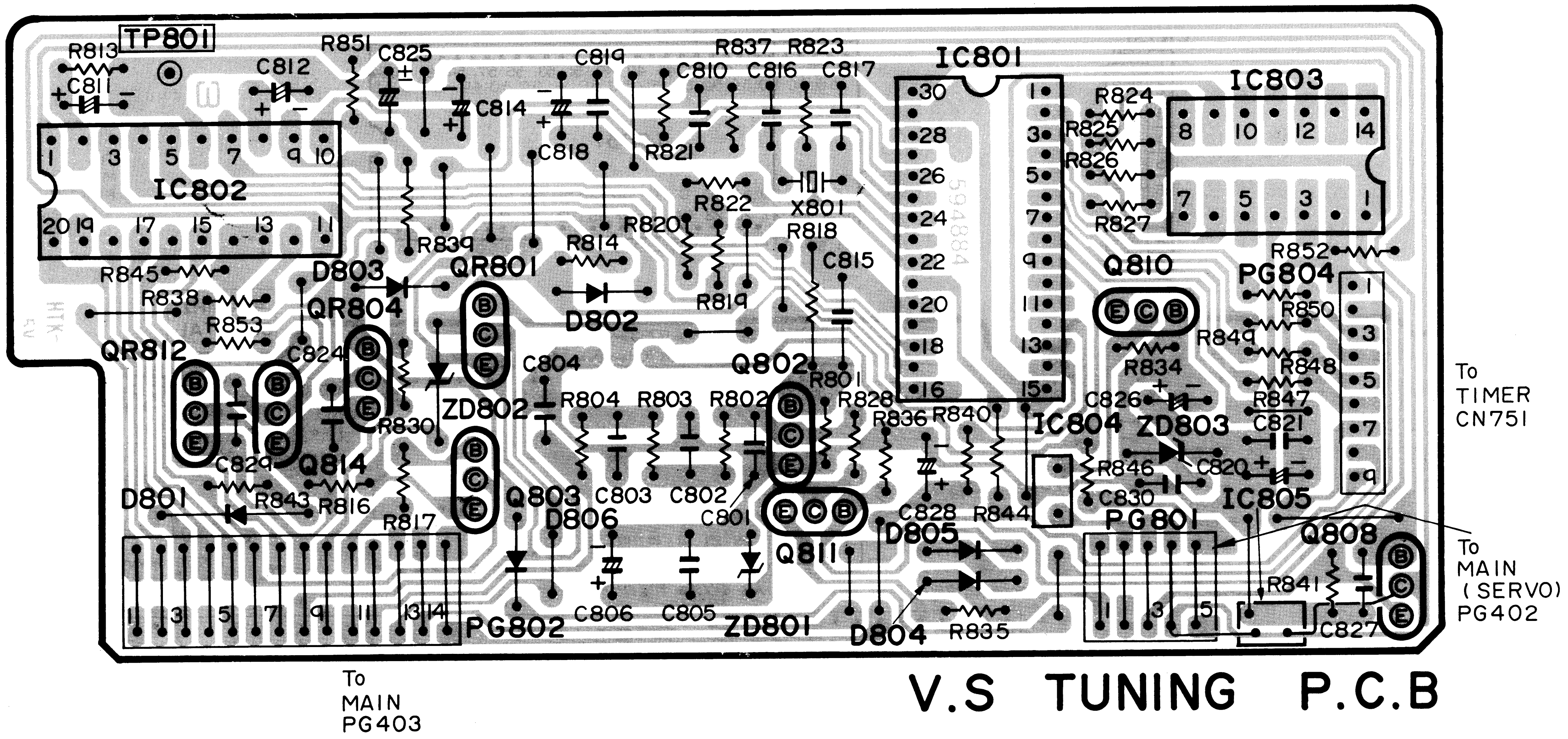
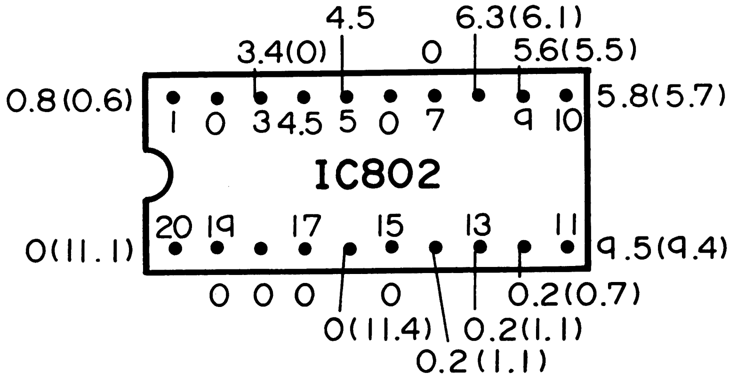
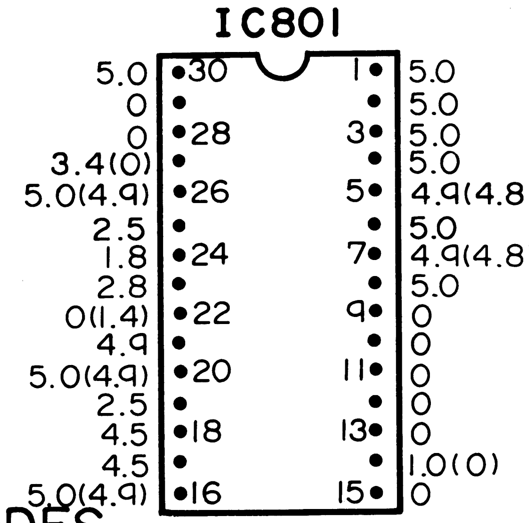
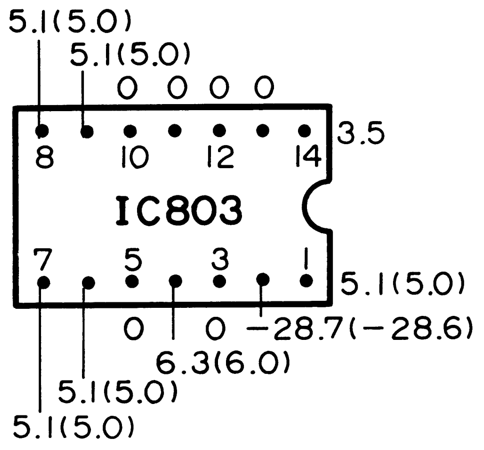

TP801
R813
C811
C812
R851
C825
C814
C819
C818
R837
R823
C810
C816
C817
R821
R822
X801
R820
R818
C815
R819
IC801
IC802
IC803
R824
R825
R826
R827
R839
R814
D802
D803
QR801
QR804
QR812
R845
R838
R853
C824
C804
ZD802
R830
C829
Q814
R843
R816
R817
D801
Q803
D806
C803
C802
C801
R804
R803
R802
Q802
R801
R828
R836
R840
IC804
ZD803
R846
C830
C826
C821
C820
R847
R848
R849
R850
R834
R852
PG804
Q810
IC805
PG801
Q808
R841
C827
Q811
D805
C828
R844
D804
R835
ZD801
C806
C805
PG802
To TIMER CN751
To MAIN (SERVO) PG402
To MAIN PG403

V.S TUNING P.C.B

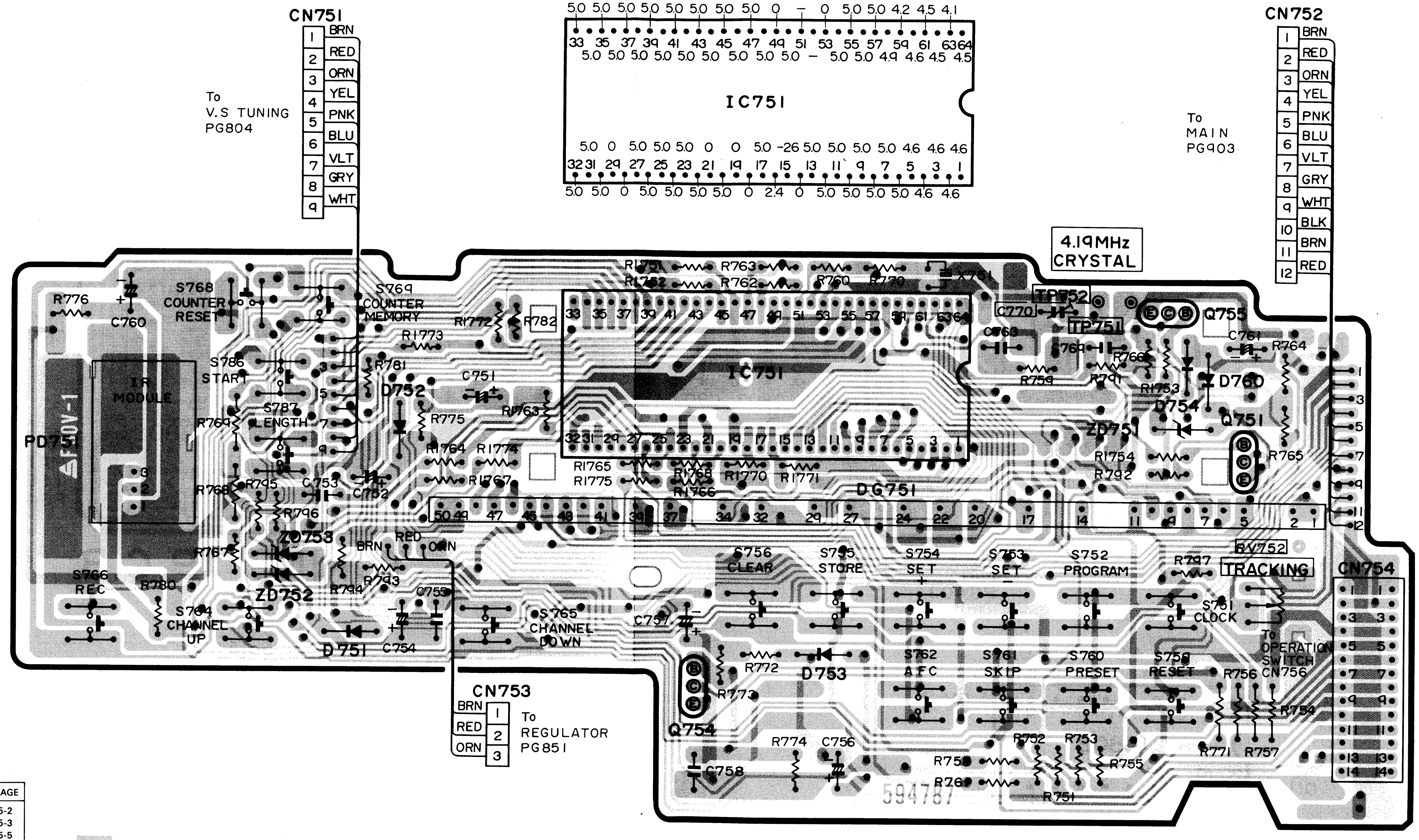

IC802
4.5
6.3(6.1)
3.4(0)
0
5.6(5.5)
0.8(0.6)
5.8(5.7)
1 0 3 4.5 5 0 7 9 10
20 19 17 15 13 11
0(11.1)
9.5(9.4)
0 0 0
0
0(11.4)
0.2(1.1)
0.2(1.1)
0.2(0.7)


IC801
5.0 30
0
0 28
3.4(0)
5.0(4.9) 26
2.5
1.8 24
2.8
0(1.4) 22
4.9
5.0(4.9) 20
2.5
4.5 18
4.5
5.0(4.9) 16
1 5.0
5.0
3 5.0
5.0
5 4.9(4.8)
5.0
7 4.9(4.8)
5.0
9 0
0
11 0
0
13 0
1.0(0)
15 0


5.1(5.0)
5.1(5.0)
0 0 0 0
8 10 12 14
3.5
IC803
7 5 3 1
5.1(5.0)
0
0
-28.7(-28.6)
6.3(6.0)
5.1(5.0)
5.1(5.0)

※ ONE VOLTAGE : PB OR REC MODE,
TWO VOLTAGES : PB AND (REC) MODES.

TIMER -VT-110E-



CN751
To V.S TUNING PG804
1 BRN
2 RED
3 ORN
4 YEL
5 PNK
6 BLU
7 VLT
8 GRY
9 WHT
5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 0 – 0 5.0 5.0 4.2 4.5 4.1
33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 64
5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 – 5.0 5.0 4.9 4.6 4.5 4.5
IC751
5.0 0 5.0 5.0 5.0 0 0 5.0 -26 5.0 5.0 5.0 5.0 4.6 4.6 4.6
32 31 29 27 25 23 21 19 17 15 13 11 9 7 5 3 1
5.0 5.0 0 5.0 5.0 5.0 5.0 0 2.4 0 5.0 5.0 5.0 5.0 4.6 4.6
CN752
To MAIN PG903
1 BRN
2 RED
3 ORN
4 YEL
5 PNK
6 BLU
7 VLT
8 GRY
9 WHT
10 BLK
11 BRN
12 RED
4.19MHz CRYSTAL
R776
C760
S768 COUNTER RESET
S769 COUNTER MEMORY
S786 START
S787 LENGTH
IR MODULE
PD751
R1772
R782
R1773
R781
D752
C751
R775
R1763
R769
R768
R795
C753
C752
R796
R1764
R1774
R1767
R1765
R1775
R1768
R1766
R1770
R1771
R1751
R1752
R763
R762
R760
R770
X751
TP752
C770
TP751
C763
R761
R766
R759
R791
R1753
Q755
C761
R764
D760
D754
ZD751
Q751
R1754
R792
R765
DG751
ZD753
R767
ZD752
BRN
RED
ORN
R793
R794
C755
S766 REC
R780
S764 CHANNEL UP
D751
C754
S765 CHANNEL DOWN
C757
S756 CLEAR
S755 STORE
S754 SET +
S753 SET −
S752 PROGRAM
R797
RV752
TRACKING
CN754
S751 CLOCK
To OPERATION SWITCH CN756
Q754
R772
R773
D753
S762 AFC
S761 SKIP
S760 PRESET
S759 RESET
R756
R754
R774
C756
C758
R752
R753
R758
R76?
R755
R751
R771
R757
594787
CN753
To REGULATOR PG851
BRN 1
RED 2
ORN 3

TIMER P.C.B

▨ Solderd side Parts side ● Through hole

※VOLTAGES : ARE AS MEASURED IN THE STOP MODE

MC-Service

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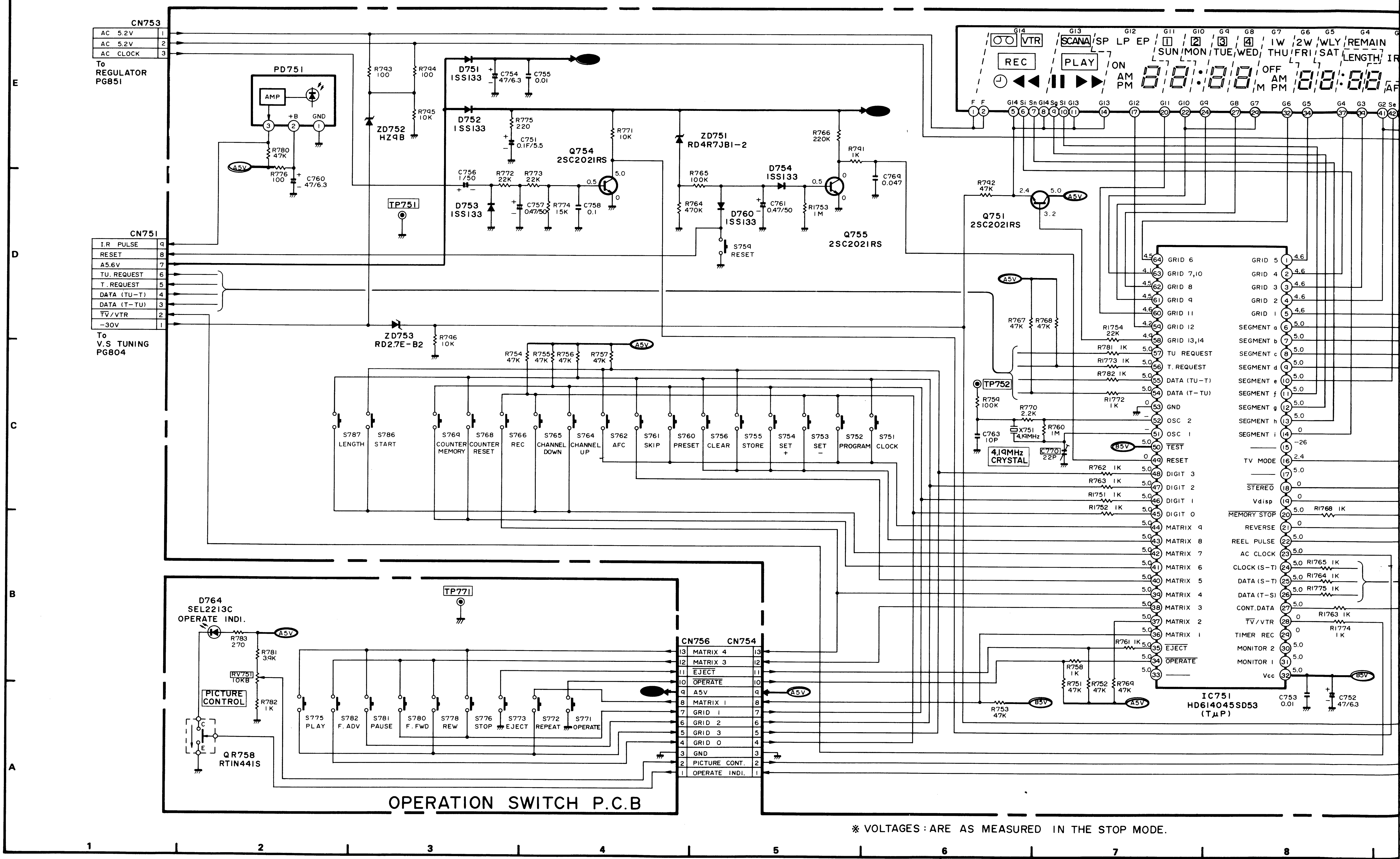
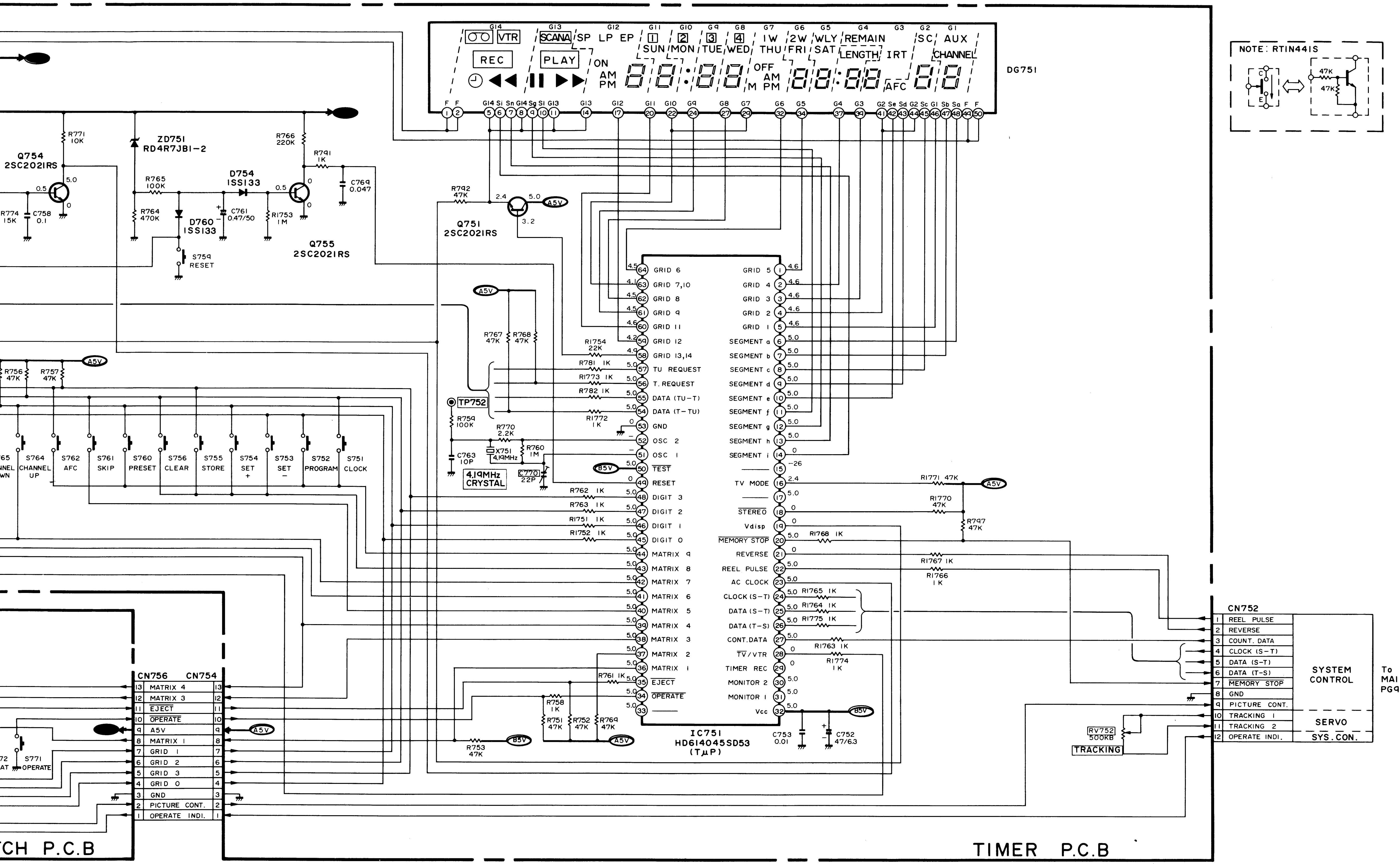
TIMER/OPERATION SWITCH (TIMER/FUNKTIONSSCHALTER)
- VT-110E -


CN753
AC 5.2V
AC 5.2V
AC CLOCK
To REGULATOR PG851
PD751
AMP
+B
GND
R780 47K
R776 100
C760 47/6.3
A5V
R793 100
R794 100
R795 10K
ZD752 HZ9B
D751 1SS133
C754 47/6.3
C755 0.01
D752 1SS133
R775 220
C751 0.1F/5.5
R771 10K
Q754 2SC2021RS
C756 1/50
R772 22K
R773 22K
C757 0.47/50
R774 15K
C758 0.1
D753 1SS133
TP751
ZD751 RD4R7JB1-2
R765 100K
R764 470K
D760 1SS133
S759 RESET
D754 1SS133
C761 0.47/50
R1753 1M
R766 220K
R791 1K
C769 0.047
Q755 2SC2021RS
R792 47K
Q751 2SC2021RS
CN751
I.R PULSE
RESET
A5.6V
TU. REQUEST
T. REQUEST
DATA (TU-T)
DATA (T-TU)
TV/VTR
-30V
To V.S TUNING PG804
ZD753 RD2.7E-B2
R796 10K
R754 47K
R755 47K
R756 47K
R757 47K
S787 LENGTH
S786 START
S769 COUNTER MEMORY
S768 COUNTER RESET
S766 REC
S765 CHANNEL DOWN
S764 CHANNEL UP
S762 AFC
S761 SKIP
S760 PRESET
S756 CLEAR
S755 STORE
S754 SET +
S753 SET −
S752 PROGRAM
S751 CLOCK
G14 VTR
G13 SCANA SP LP EP
SUN MON TUE WED THU FRI SAT
REC
PLAY
ON AM PM
OFF AM PM
1W 2W WLY REMAIN
LENGTH
R767 47K
R768 47K
TP752
R759 100K
C763 10P
X751 4.19MHz
R770 2.2K
R760 1M
4.19MHz CRYSTAL
C770 22P
B5V
R1754 22K
R781 1K
R1773 1K
R782 1K
R1772 1K
R762 1K
R763 1K
R1751 1K
R1752 1K
R761 1K
R758 1K
R751 47K
R752 47K
R769 47K
R753 47K
GRID 6
GRID 7,10
GRID 8
GRID 9
GRID 11
GRID 12
GRID 13,14
TU REQUEST
T. REQUEST
DATA (TU-T)
DATA (T-TU)
GND
OSC 2
OSC 1
TEST
RESET
DIGIT 3
DIGIT 2
DIGIT 1
DIGIT 0
MATRIX 9
MATRIX 8
MATRIX 7
MATRIX 6
MATRIX 5
MATRIX 4
MATRIX 3
MATRIX 2
MATRIX 1
EJECT
OPERATE
GRID 5
GRID 4
GRID 3
GRID 2
GRID 1
SEGMENT a
SEGMENT b
SEGMENT c
SEGMENT d
SEGMENT e
SEGMENT f
SEGMENT g
SEGMENT h
SEGMENT i
TV MODE
STEREO
Vdisp
MEMORY STOP
REVERSE
REEL PULSE
AC CLOCK
CLOCK (S-T)
DATA (S-T)
DATA (T-S)
CONT.DATA
TV/VTR
TIMER REC
MONITOR 2
MONITOR 1
Vcc
R1768 1K
R1765 1K
R1764 1K
R1775 1K
R1763 1K
R1774 1K
IC751 HD614045SD53 (TμP)
C753 0.01
C752 47/6.3
D764 SEL2213C OPERATE INDI.
R783 270
R781 3.9K
RV751 10KB
PICTURE CONTROL
R782 1K
QR758 RTIN441S
TP771
S775 PLAY
S782 F.ADV
S781 PAUSE
S780 F.FWD
S778 REW
S776 STOP
S773 EJECT
S772 REPEAT
S771 OPERATE
CN756
CN754
MATRIX 4
MATRIX 3
EJECT
OPERATE
A5V
MATRIX 1
GRID 1
GRID 2
GRID 3
GRID 0
GND
PICTURE CONT.
OPERATE INDI.
OPERATION SWITCH P.C.B
E
D
C
B
A
1
2
3
4
5
6
7
8

※ VOLTAGES : ARE AS MEASURED IN THE STOP MODE.

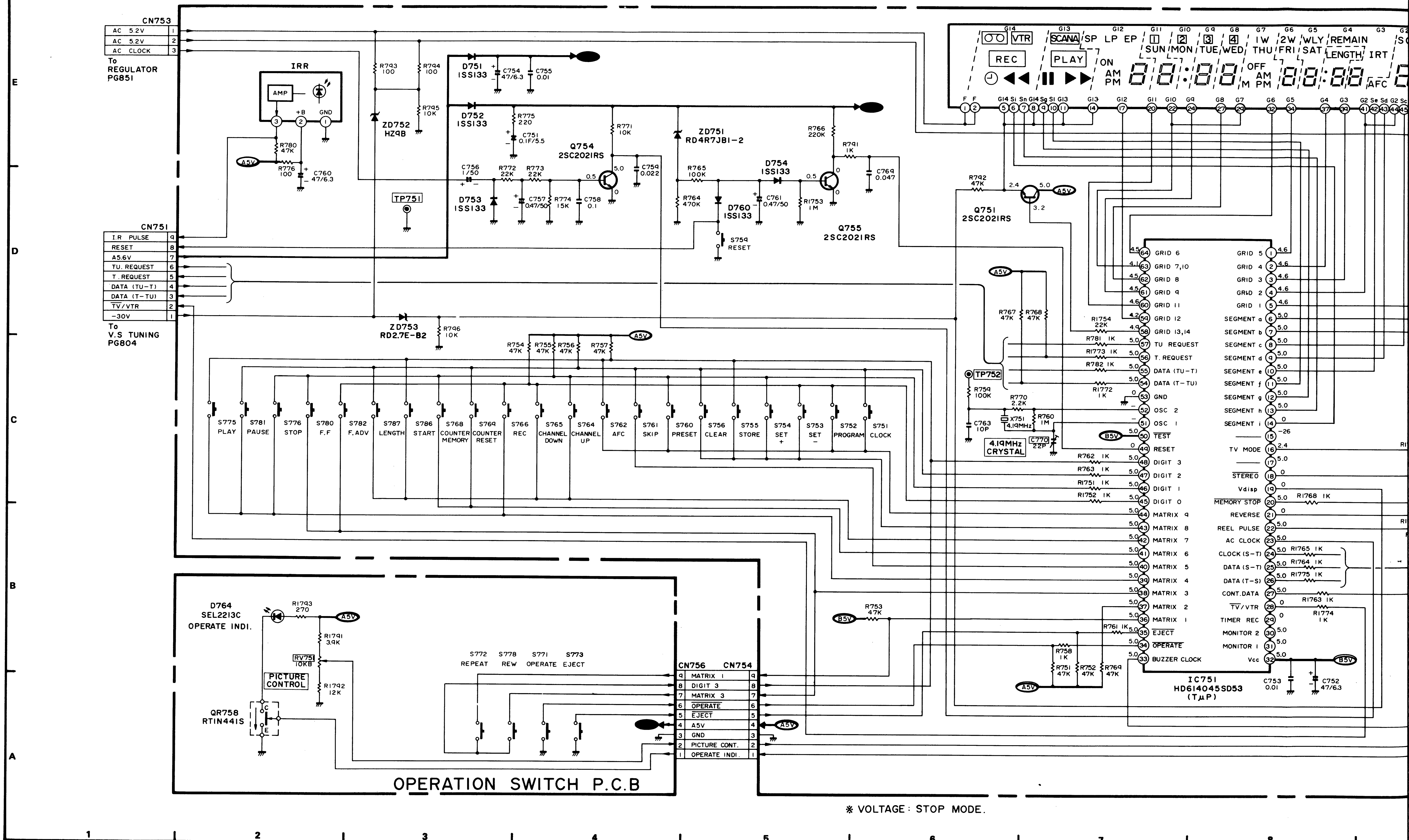
LTER)


DG751
G14 G13 G12 G11 G10 G9 G8 G7 G6 G5 G4 G3 G2 G1
VTR
SCANA SP LP EP
SUN MON TUE WED THU FRI SAT
1W 2W WLY REMAIN
LENGTH IRT
SC AUX
CHANNEL
REC
PLAY
ON
AM PM
OFF
AFC
NOTE: RTIN441S
47K
ZD751
RD4R7JB1-2
Q754
2SC2021RS
Q755
2SC2021RS
Q751
2SC2021RS
D754
1SS133
D760
1SS133
R771 10K
R765 100K
R764 470K
R766 220K
R791 1K
C769 0.047
C761 0.47/50
R1753 1M
R774 15K
C758 0.1
R792 47K
S759 RESET
A5V
B5V
R767 47K
R768 47K
R1754 22K
R781 1K
R1773 1K
R782 1K
R1772 1K
TP752
R759 100K
R770 2.2K
X751 4.19MHz
R760 1M
C763 10P
C770 22P
4.19MHz CRYSTAL
R762 1K
R763 1K
R1751 1K
R1752 1K
R756 47K
R757 47K
S765 CHANNEL DOWN
S764 CHANNEL UP
S762 AFC
S761 SKIP
S760 PRESET
S756 CLEAR
S755 STORE
S754 SET +
S753 SET −
S752 PROGRAM
S751 CLOCK
S772 …AT
S771 OPERATE
IC751
HD614045SD53
(TμP)
64 GRID 6
63 GRID 7,10
62 GRID 8
61 GRID 9
60 GRID 11
59 GRID 12
58 GRID 13,14
57 TU REQUEST
56 T. REQUEST
55 DATA (TU−T)
54 DATA (T−TU)
53 GND
52 OSC 2
51 OSC 1
50 TEST
49 RESET
48 DIGIT 3
47 DIGIT 2
46 DIGIT 1
45 DIGIT 0
44 MATRIX 9
43 MATRIX 8
42 MATRIX 7
41 MATRIX 6
40 MATRIX 5
39 MATRIX 4
38 MATRIX 3
37 MATRIX 2
36 MATRIX 1
35 EJECT
34 OPERATE
33 —
1 GRID 5
2 GRID 4
3 GRID 3
4 GRID 2
5 GRID 1
6 SEGMENT a
7 SEGMENT b
8 SEGMENT c
9 SEGMENT d
10 SEGMENT e
11 SEGMENT f
12 SEGMENT g
13 SEGMENT h
14 SEGMENT i
15 —
16 TV MODE
17 —
18 STEREO
19 Vdisp
20 MEMORY STOP
21 REVERSE
22 REEL PULSE
23 AC CLOCK
24 CLOCK (S−T)
25 DATA (S−T)
26 DATA (T−S)
27 CONT.DATA
28 TV/VTR
29 TIMER REC
30 MONITOR 2
31 MONITOR 1
32 Vcc
R1771 47K
R1770 47K
R797 47K
R1768 1K
R1767 1K
R1766 1K
R1765 1K
R1764 1K
R1775 1K
R1763 1K
R1774 1K
R761 1K
R758 1K
R751 47K
R752 47K
R769 47K
R753 47K
C753 0.01
C752 47/6.3
CN756 CN754
13 MATRIX 4
12 MATRIX 3
11 EJECT
10 OPERATE
9 A5V
8 MATRIX 1
7 GRID 1
6 GRID 2
5 GRID 3
4 GRID 0
3 GND
2 PICTURE CONT.
1 OPERATE INDI.
CN752
1 REEL PULSE
2 REVERSE
3 COUNT. DATA
4 CLOCK (S−T)
5 DATA (S−T)
6 DATA (T−S)
7 MEMORY STOP
8 GND
9 PICTURE CONT.
10 TRACKING 1
11 TRACKING 2
12 OPERATE INDI.
SYSTEM CONTROL
SERVO
SYS. CON.
To MAIN PG903
RV752 500KB
TRACKING
…CH P.C.B
TIMER P.C.B

※ VOLTAGES : ARE AS MEASURED IN THE STOP MODE.

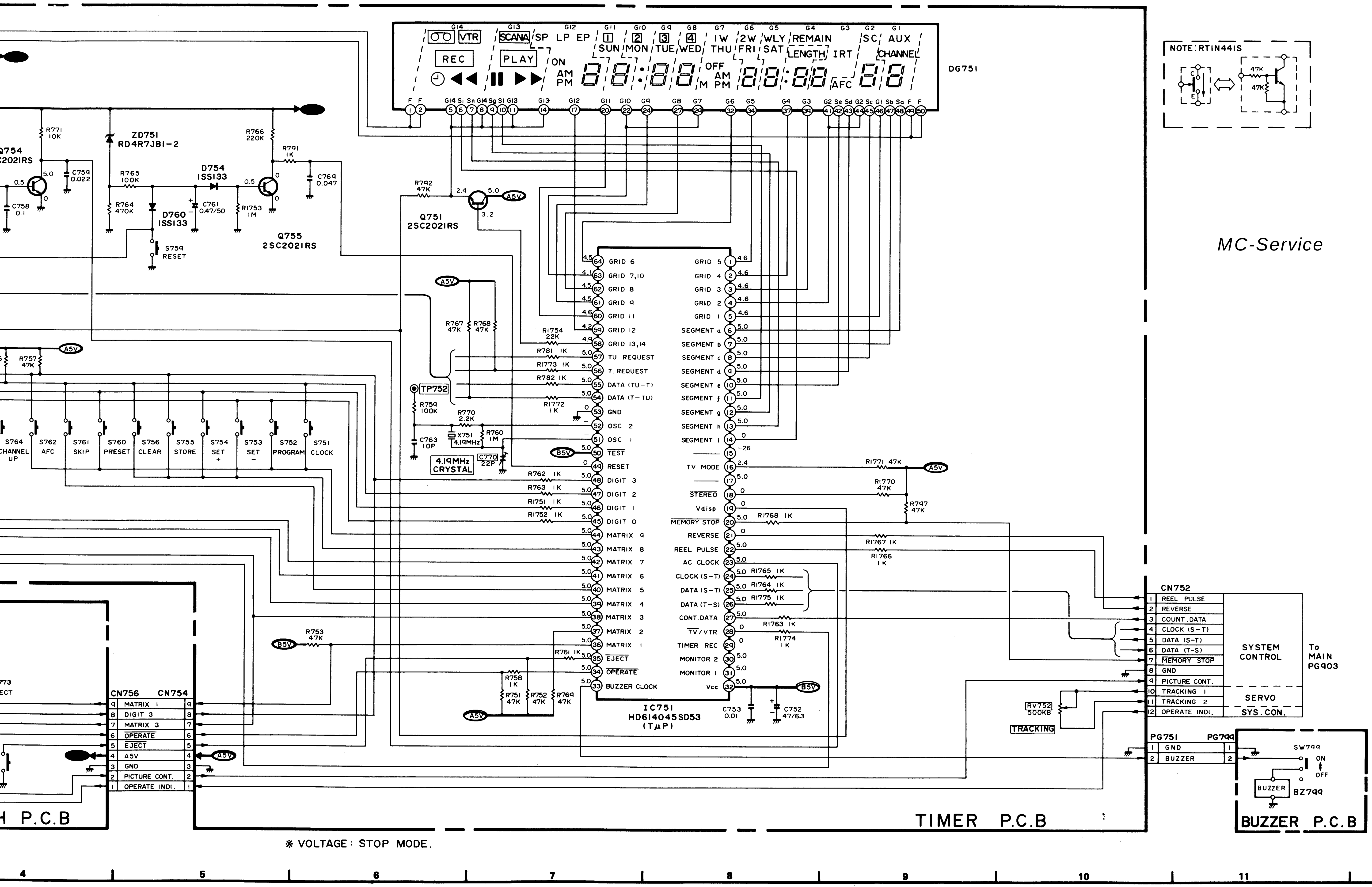
4 5 6 7 8 9 10 11

TIMER/OPERATION SWITCH (TIMER/FUNKTIONSSCHALTER)
– VT-120E –


CN753
AC 5.2V
AC 5.2V
AC CLOCK
To REGULATOR PG851
IRR
AMP
+B
GND
R780 47K
R776 100
C760 47/6.3
A5V
CN751
I.R PULSE
RESET
A5.6V
TU. REQUEST
T. REQUEST
DATA (TU-T)
DATA (T-TU)
TV/VTR
-30V
To V.S TUNING PG804
R793 100
R794 100
R795 10K
ZD752 HZ9B
TP751
D751 1SS133
C754 47/6.3
C755 0.01
D752 1SS133
R775 220
C751 0.1F/5.5
R771 10K
C759 0.022
Q754 2SC2021RS
C756 1/50
R772 22K
R773 22K
D753 1SS133
C757 0.47/50
R774 15K
C758 0.1
ZD751 RD4R7JB1-2
R765 100K
R764 470K
D754 1SS133
D760 1SS133
C761 0.47/50
R1753 1M
S759 RESET
R766 220K
R791 1K
C769 0.047
Q755 2SC2021RS
R792 47K
Q751 2SC2021RS
ZD753 RD2.7E-B2
R796 10K
R754 47K
R755 47K
R756 47K
R757 47K
S775 PLAY
S781 PAUSE
S776 STOP
S780 F.F
S782 F.ADV
S787 LENGTH
S786 START
S768 COUNTER MEMORY
S769 COUNTER RESET
S766 REC
S765 CHANNEL DOWN
S764 CHANNEL UP
S762 AFC
S761 SKIP
S760 PRESET
S756 CLEAR
S755 STORE
S754 SET +
S753 SET −
S752 PROGRAM
S751 CLOCK
G14 G13 G12 G11 G10 G9 G8 G7 G6 G5 G4 G3
VTR
SCAN
SP LP EP
SUN MON TUE WED THU FRI SAT
1W 2W WLY REMAIN LENGTH IRT
REC
PLAY
ON
AM PM
OFF
AFC
R767 47K
R768 47K
TP752
R759 100K
R770 2.2K
X751 4.19MHz
R760 1M
C763 10P
4.19MHz CRYSTAL
C770 22P
B5V
R1754 22K
R781 1K
R1773 1K
R782 1K
R1772 1K
R762 1K
R763 1K
R1751 1K
R1752 1K
GRID 6
GRID 7,10
GRID 8
GRID 9
GRID 11
GRID 12
GRID 13,14
TU REQUEST
T. REQUEST
DATA (TU-T)
DATA (T-TU)
GND
OSC 2
OSC 1
TEST
RESET
DIGIT 3
DIGIT 2
DIGIT 1
DIGIT 0
MATRIX 9
MATRIX 8
MATRIX 7
MATRIX 6
MATRIX 5
MATRIX 4
MATRIX 3
MATRIX 2
MATRIX 1
EJECT
OPERATE
BUZZER CLOCK
GRID 5
GRID 4
GRID 3
GRID 2
GRID 1
SEGMENT a
SEGMENT b
SEGMENT c
SEGMENT d
SEGMENT e
SEGMENT f
SEGMENT g
SEGMENT h
SEGMENT i
TV MODE
STEREO
Vdisp
MEMORY STOP
REVERSE
REEL PULSE
AC CLOCK
CLOCK (S-T)
DATA (S-T)
DATA (T-S)
CONT. DATA
TV/VTR
TIMER REC
MONITOR 2
MONITOR 1
Vcc
R1768 1K
R1765 1K
R1764 1K
R1775 1K
R1763 1K
R1774 1K
R761 1K
R753 47K
R758 1K
R751 47K
R752 47K
R769 47K
IC751 HD614045SD53 (TμP)
C753 0.01
C752 47/6.3
D764 SEL2213C OPERATE INDI.
R1793 270
R1791 3.9K
RV751 10KB
PICTURE CONTROL
R1792 12K
QR758 RTIN441S
S772 REPEAT
S778 REW
S771 OPERATE
S773 EJECT
CN756
CN754
MATRIX 1
DIGIT 3
MATRIX 3
OPERATE
EJECT
A5V
GND
PICTURE CONT.
OPERATE INDI.
OPERATION SWITCH P.C.B
A B C D E
1 2 3 4 5 6 7 8

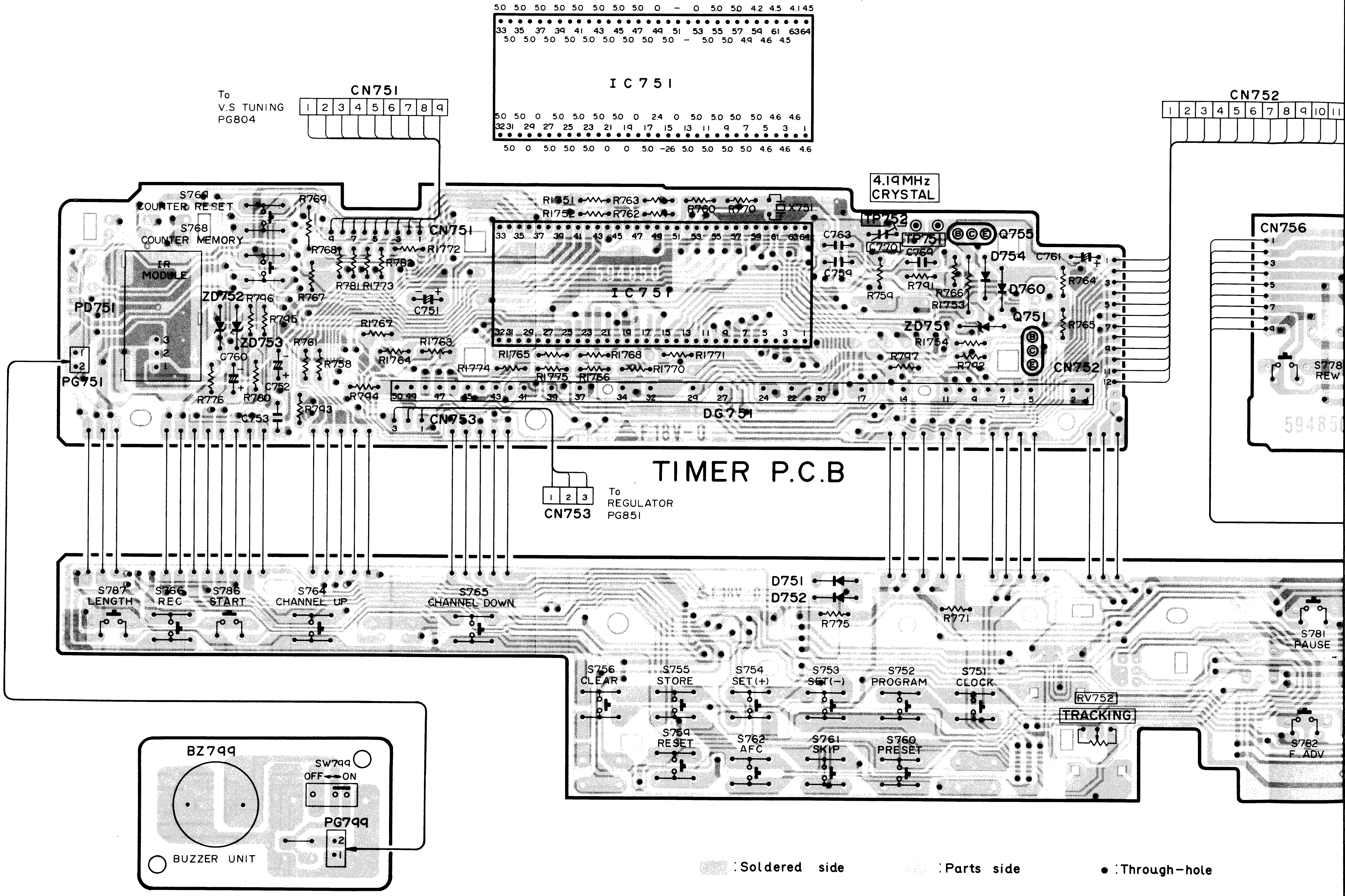
※ VOLTAGE : STOP MODE.

ER)



DG751
G14 G13 G12 G11 G10 G9 G8 G7 G6 G5 G4 G3 G2 G1
VTR SCAN A SP LP EP 1 2 3 4 1W 2W WLY REMAIN SC AUX
REC PLAY ON AM PM SUN MON TUE WED THU FRI SAT LENGTH IRT CHANNEL
OFF AM PM M AFC
NOTE: RTIN441S
47K 47K
R771 10K
ZD751 RD4R7JB1-2
R766 220K
R791 1K
Q754 2SC2021RS
C759 0.022
D754 1SS133
C769 0.047
R765 100K
C758 0.1
R764 470K
C761 0.47/50
R1753 1M
D760 1SS133
Q755 2SC2021RS
S759 RESET
R792 47K
Q751 2SC2021RS
A5V
B5V
R767 47K
R768 47K
R1754 22K
R781 1K
R1773 1K
R782 1K
R1772 1K
TP752
R759 100K
R770 2.2K
X751 4.19MHz
R760 1M
C763 10P
4.19MHz CRYSTAL
C770 22P
R757 47K
S764 CHANNEL UP
S762 AFC
S761 SKIP
S760 PRESET
S756 CLEAR
S755 STORE
S754 SET +
S753 SET −
S752 PROGRAM
S751 CLOCK
R762 1K
R763 1K
R1751 1K
R1752 1K
R753 47K
R761 1K
R758 1K
R751 47K
R752 47K
R769 47K
GRID 6, GRID 7,10, GRID 8, GRID 9, GRID 11, GRID 12, GRID 13,14
TU REQUEST, T. REQUEST, DATA (TU−T), DATA (T−TU), GND, OSC 2, OSC 1, TEST, RESET
DIGIT 3, DIGIT 2, DIGIT 1, DIGIT 0
MATRIX 9, MATRIX 8, MATRIX 7, MATRIX 6, MATRIX 5, MATRIX 4, MATRIX 3, MATRIX 2, MATRIX 1
EJECT, OPERATE, BUZZER CLOCK
GRID 5, GRID 4, GRID 3, GRID 2, GRID 1
SEGMENT a, SEGMENT b, SEGMENT c, SEGMENT d, SEGMENT e, SEGMENT f, SEGMENT g, SEGMENT h, SEGMENT i
TV MODE, STEREO, Vdisp, MEMORY STOP, REVERSE, REEL PULSE, AC CLOCK
CLOCK (S−T), DATA (S−T), DATA (T−S), CONT.DATA, TV/VTR, TIMER REC, MONITOR 2, MONITOR 1, Vcc
IC751 HD614045SD53 (TμP)
C753 0.01
C752 47/6.3
R1771 47K
R1770 47K
R797 47K
R1768 1K
R1767 1K
R1766 1K
R1765 1K
R1764 1K
R1775 1K
R1763 1K
R1774 1K
CN752
1 REEL PULSE
2 REVERSE
3 COUNT. DATA
4 CLOCK (S−T)
5 DATA (S−T)
6 DATA (T−S)
7 MEMORY STOP
8 GND
9 PICTURE CONT.
10 TRACKING 1
11 TRACKING 2
12 OPERATE INDI.
SYSTEM CONTROL
SERVO
SYS. CON.
To MAIN PG903
RV752 500KB
TRACKING
PG751 PG799
1 GND
2 BUZZER
SW799 ON OFF
BUZZER BZ799
BUZZER P.C.B
CN756 CN754
9 MATRIX 1
8 DIGIT 3
7 MATRIX 3
6 OPERATE
5 EJECT
4 A5V
3 GND
2 PICTURE CONT.
1 OPERATE INDI.
H P.C.B
TIMER P.C.B
4 5 6 7 8 9 10 11

※ VOLTAGE : STOP MODE.


IC751
CN751
To
V.S TUNING
PG804
CN752
CN756
4.19MHz
CRYSTAL
S769
COUNTER RESET
S768
COUNTER MEMORY
IR MODULE
PD751
PG751
ZD752
ZD753
ZD751
Q751
Q755
D754
D760
X751
TP751
TP752
C751
C752
C753
C759
C760
C761
C763
C769
C770
R758
R759
R761
R762
R763
R764
R765
R766
R767
R768
R769
R770
R776
R780
R781
R783
R791
R792
R793
R794
R796
R797
R798
R1751
R1752
R1753
R1754
R1763
R1764
R1765
R1766
R1767
R1768
R1770
R1771
R1772
R1773
R1774
R1775
DG751
CN753
TIMER P.C.B
To
REGULATOR
PG851
S787
LENGTH
S766
REC
S786
START
S764
CHANNEL UP
S765
CHANNEL DOWN
D751
D752
R775
R771
S756
CLEAR
S755
STORE
S754
SET (+)
S753
SET (−)
S752
PROGRAM
S751
CLOCK
S759
RESET
S762
AFC
S761
SKIP
S760
PRESET
RV752
TRACKING
S778
REW
S781
PAUSE
S782
F. ADV
BZ799
SW799
OFF ←→ ON
PG799
BUZZER UNIT
▨ :Soldered side
▨ :Parts side
● :Through-hole

BUZZER P.C.B

※ VOLTAGE : STOP MODE.

SCHEMATIC DIAGRAM	PAGE
TUNER UNIT	5-2
IF UNIT	5-3
V·S TUNING	5-5
TIMER/OPERATION SWITCH – VT-110E –	5-11
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AUDIO/REAR JACK	5-26
RF CONVERTER	5-29
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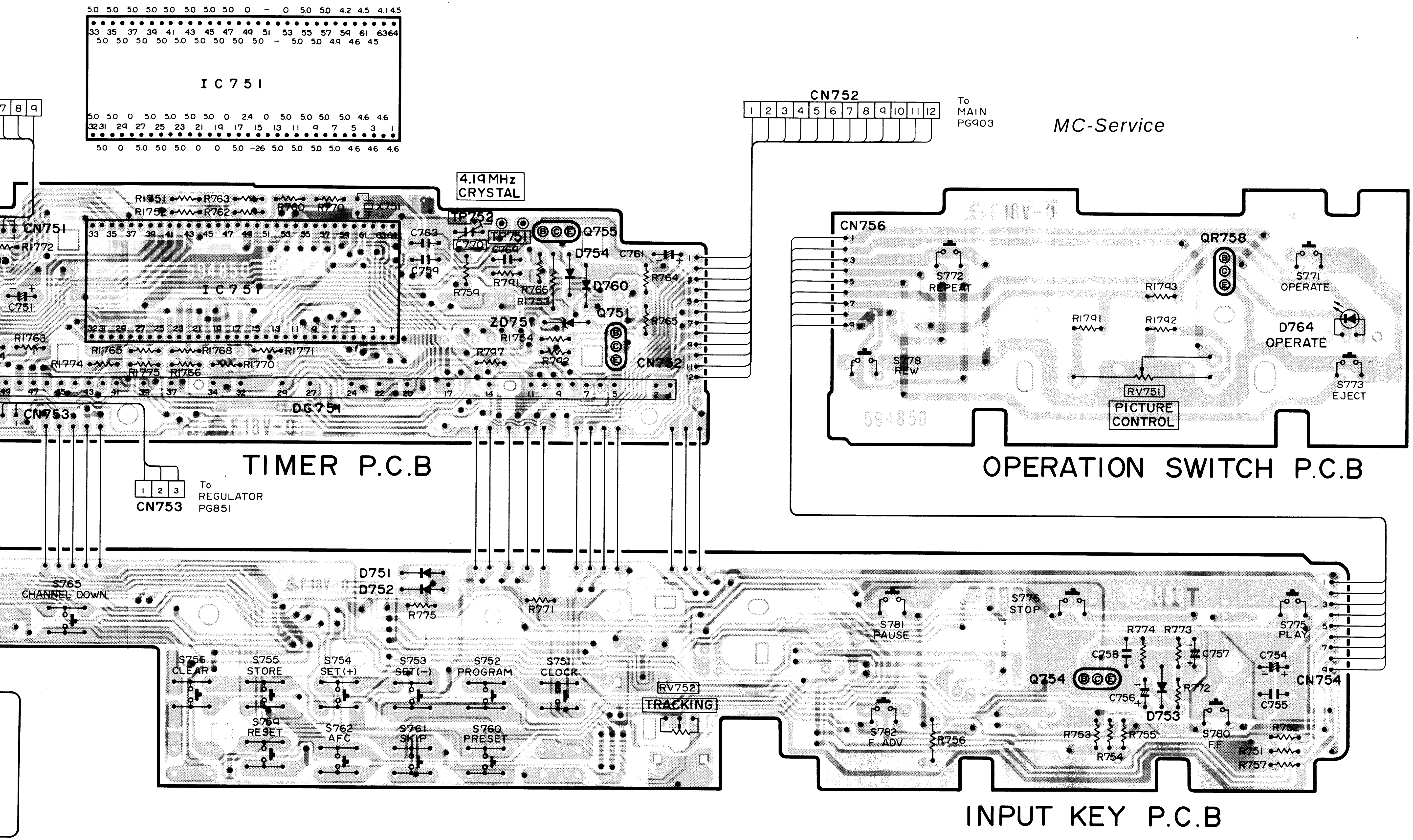
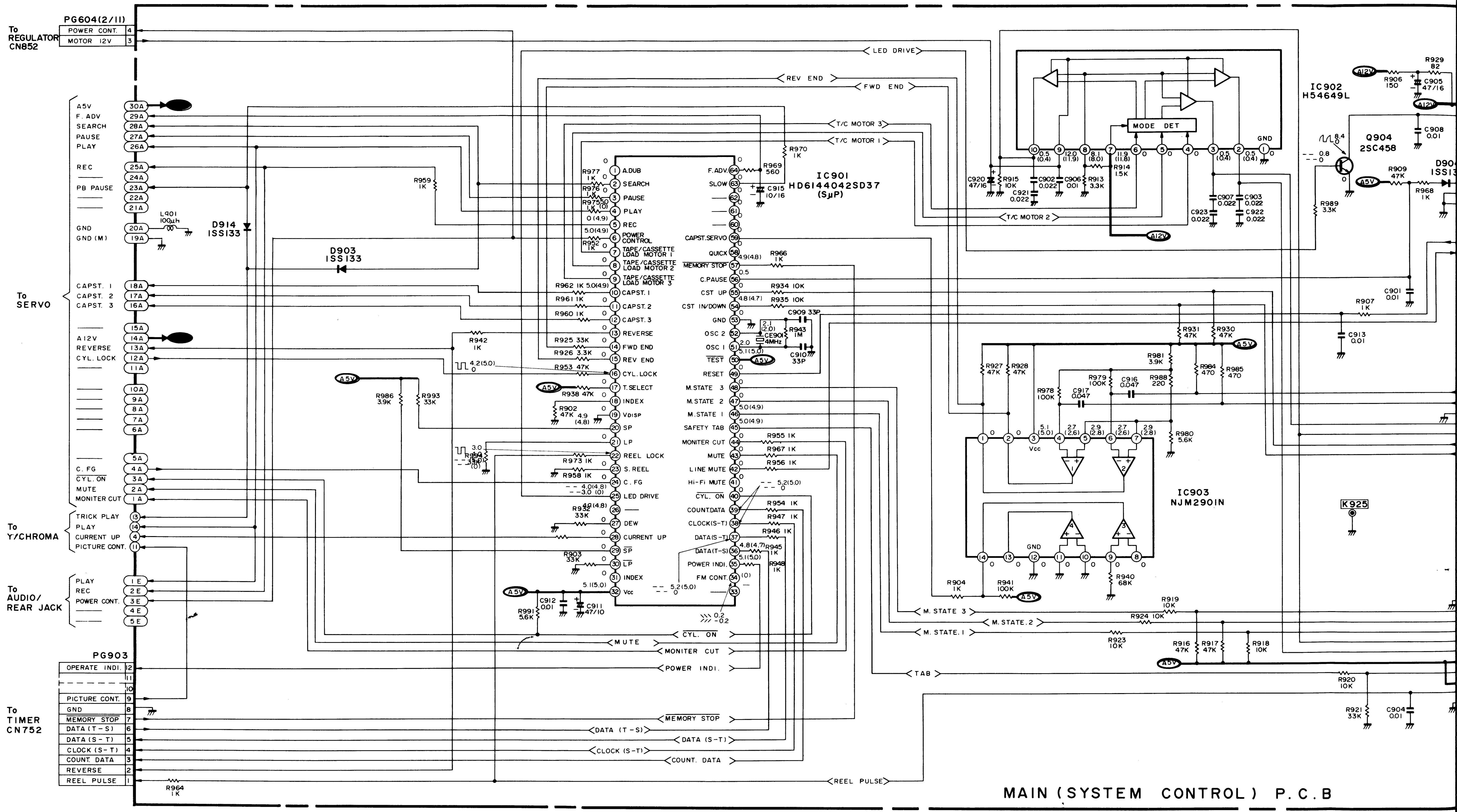


5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 0 – 0 5.0 5.0 4.2 4.5 4.1 4.5
33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 64
5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 – 5.0 5.0 4.9 4.6 4.5
IC751
5.0 5.0 0 5.0 5.0 5.0 5.0 0 2.4 0 5.0 5.0 5.0 5.0 4.6 4.6
32 31 29 27 25 23 21 19 17 15 13 11 9 7 5 3 1
5.0 0 5.0 5.0 5.0 0 0 5.0 -26 5.0 5.0 5.0 5.0 4.6 4.6 4.6
CN752
1 2 3 4 5 6 7 8 9 10 11 12
To MAIN PG903
4.19MHz CRYSTAL
TP752
TP751
C770
Q755
X751
R1751
R1752
R763
R762
R760
R770
CN751
R1772
C763
C759
C769
R791
R766
R1753
R759
D754
D760
C761
R764
R765
ZD751
R1754
Q751
R797
R792
C751
R1763
R1765
R1768
R1771
R1774
R1775
R1766
R1770
CN753
DG751
TIMER P.C.B
CN753
1 2 3
To REGULATOR PG851
CN756
QR758
S772 REPEAT
S771 OPERATE
R1793
R1791
R1792
D764 OPERATE
S778 REW
S773 EJECT
RV751
PICTURE CONTROL
OPERATION SWITCH P.C.B
S765 CHANNEL DOWN
D751
D752
R775
R771
S756 CLEAR
S755 STORE
S754 SET(+)
S753 SET(–)
S752 PROGRAM
S751 CLOCK
S759 RESET
S762 AFC
S761 SKIP
S760 PRESET
RV752
TRACKING
S781 PAUSE
S776 STOP
S775 PLAY
R774
R773
C758
C757
C754
Q754
C756
D753
R772
C755
CN754
S782 F. ADV
R756
R753
R754
R755
S780 FF
R752
R751
R757
INPUT KEY P.C.B

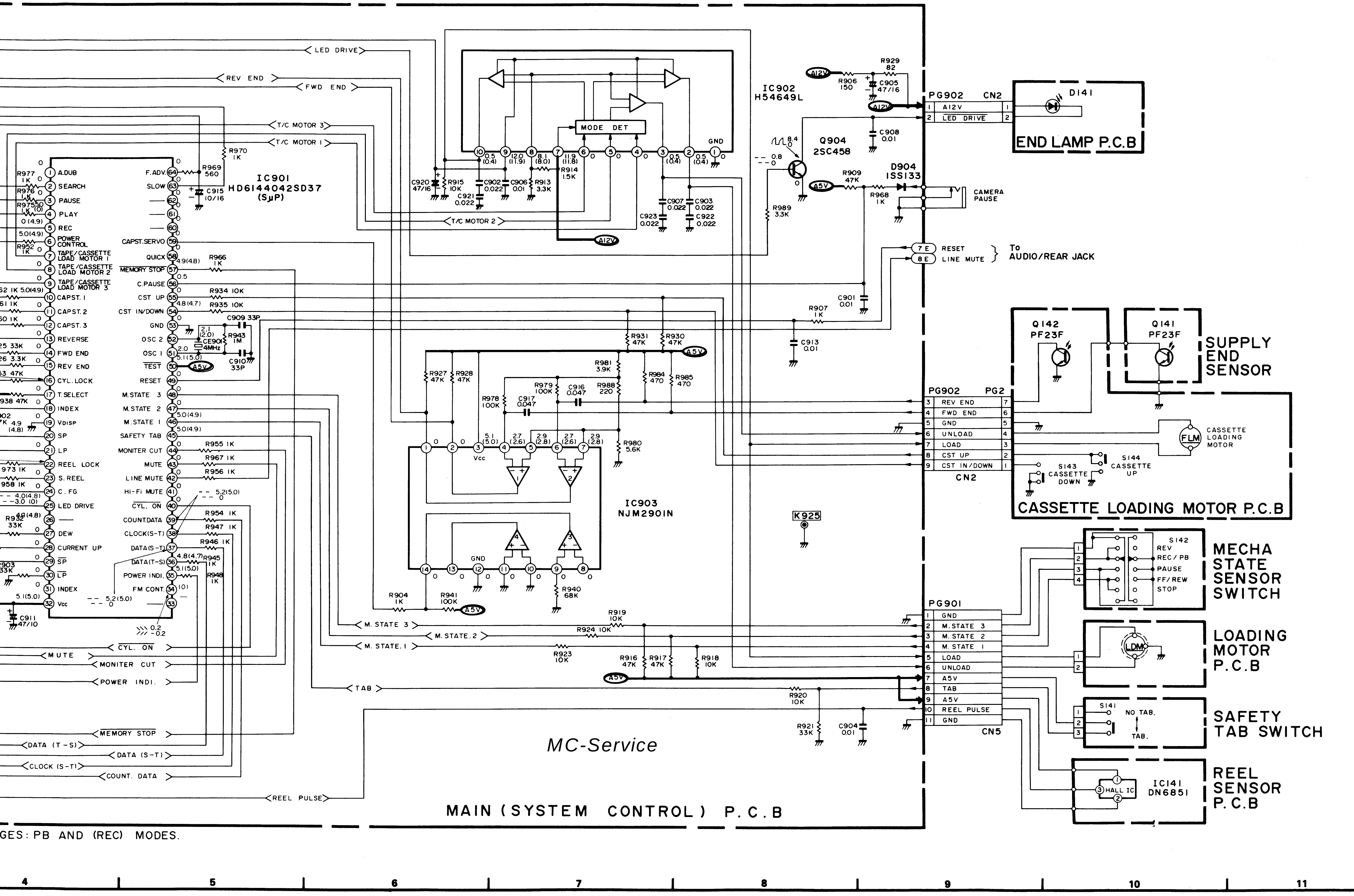
▨ :Soldered side ░ :Parts side ● :Through-hole

※ VOLTAGE : STOP MODE.

SYSTEM CONTROL (SYSTEMREGELUNG)


PG604(2/11)
To REGULATOR CN852
POWER CONT.
MOTOR 12V
To SERVO
To Y/CHROMA
To AUDIO/ REAR JACK
To TIMER CN752
PG903
A5V
F. ADV
SEARCH
PAUSE
PLAY
REC
PB PAUSE
GND
GND (M)
L901 100µH
D914 1SS133
D903 1SS133
CAPST. 1
CAPST. 2
CAPST. 3
A12V
REVERSE
CYL. LOCK
C. FG
CYL. ON
MUTE
MONITER CUT
TRICK PLAY
CURRENT UP
PICTURE CONT.
OPERATE INDI.
MEMORY STOP
DATA (T-S)
DATA (S-T)
CLOCK (S-T)
COUNT. DATA
REEL PULSE
IC901 HD6144042SD37 (SµP)
A.DUB
POWER CONTROL
TAPE/CASSETTE LOAD MOTOR 1
TAPE/CASSETTE LOAD MOTOR 2
TAPE/CASSETTE LOAD MOTOR 3
FWD END
REV END
T.SELECT
INDEX
VDISP
SP
LP
REEL LOCK
S.REEL
LED DRIVE
DEW
Vcc
F.ADV.
SLOW
CAPST.SERVO
QUICK
C.PAUSE
CST UP
CST IN/DOWN
OSC 2
OSC 1
TEST
RESET
M.STATE 3
M.STATE 2
M.STATE 1
SAFETY TAB
MONITER CUT
LINE MUTE
Hi-Fi MUTE
POWER INDI.
FM CONT.
CE901 4MHz
T/C MOTOR 1
T/C MOTOR 2
T/C MOTOR 3
IC902 H54649L
MODE DET
Q904 2SC458
IC903 NJM2901N
K925
TAB
MAIN (SYSTEM CONTROL) P.C.B

※ ONE VOLTAGE: PB OR REC MODE, TWO VOLTAGES: PB AND (REC) MODES.


MAIN (SYSTEM CONTROL) P.C.B
MC-Service
IC901
HD6144042SD37
(SμP)
IC902
H54649L
IC903
NJM2901N
MODE DET
Q904
2SC458
D904
1SS133
CAMERA PAUSE
RESET
LINE MUTE
To AUDIO/REAR JACK
LED DRIVE
REV END
FWD END
T/C MOTOR 3
T/C MOTOR 1
T/C MOTOR 2
A12V
A5V
A.DUB
SEARCH
PAUSE
PLAY
REC
POWER CONTROL
TAPE/CASSETTE LOAD MOTOR 1
TAPE/CASSETTE LOAD MOTOR 2
TAPE/CASSETTE LOAD MOTOR 3
CAPST. 1
CAPST. 2
CAPST. 3
REVERSE
FWD END
REV END
CYL. LOCK
T. SELECT
INDEX
VDISP
SP
LP
REEL LOCK
S. REEL
C. FG
LED DRIVE
DEW
CURRENT UP
SP
LP
INDEX
Vcc
F. ADV.
SLOW
CAPST. SERVO
QUICK
MEMORY STOP
C. PAUSE
CST UP
CST IN/DOWN
GND
OSC 2
OSC 1
TEST
RESET
M. STATE 3
M. STATE 2
M. STATE 1
SAFETY TAB
MONITER CUT
MUTE
LINE MUTE
Hi-Fi MUTE
CYL. ON
COUNT. DATA
CLOCK (S-T)
DATA (S-T)
DATA (T-S)
POWER INDI.
FM CONT
CE901 4MHz
K925
M. STATE 3
M. STATE 2
M. STATE 1
MUTE
CYL. ON
MONITER CUT
POWER INDI.
TAB
MEMORY STOP
DATA (T-S)
DATA (S-T)
CLOCK (S-T)
COUNT. DATA
REEL PULSE
PG902 CN2
A12V
LED DRIVE
D141
END LAMP P.C.B
Q142 PF23F
Q141 PF23F
SUPPLY END SENSOR
PG902 PG2
REV END
FWD END
GND
UNLOAD
LOAD
CST UP
CST IN/DOWN
CN2
CASSETTE LOADING MOTOR
S143 CASSETTE DOWN
S144 CASSETTE UP
CASSETTE LOADING MOTOR P.C.B
S142
REV
REC/PB
PAUSE
FF/REW
STOP
MECHA STATE SENSOR SWITCH
PG901
GND
M. STATE 3
M. STATE 2
M. STATE 1
LOAD
UNLOAD
A5V
TAB
A5V
REEL PULSE
GND
CN5
LDM
LOADING MOTOR P.C.B
S141
NO TAB.
TAB.
SAFETY TAB SWITCH
IC141 DN6851
HALL IC
REEL SENSOR P.C.B
4
5
6
7
8
9
10
11

GES: PB AND (REC) MODES.

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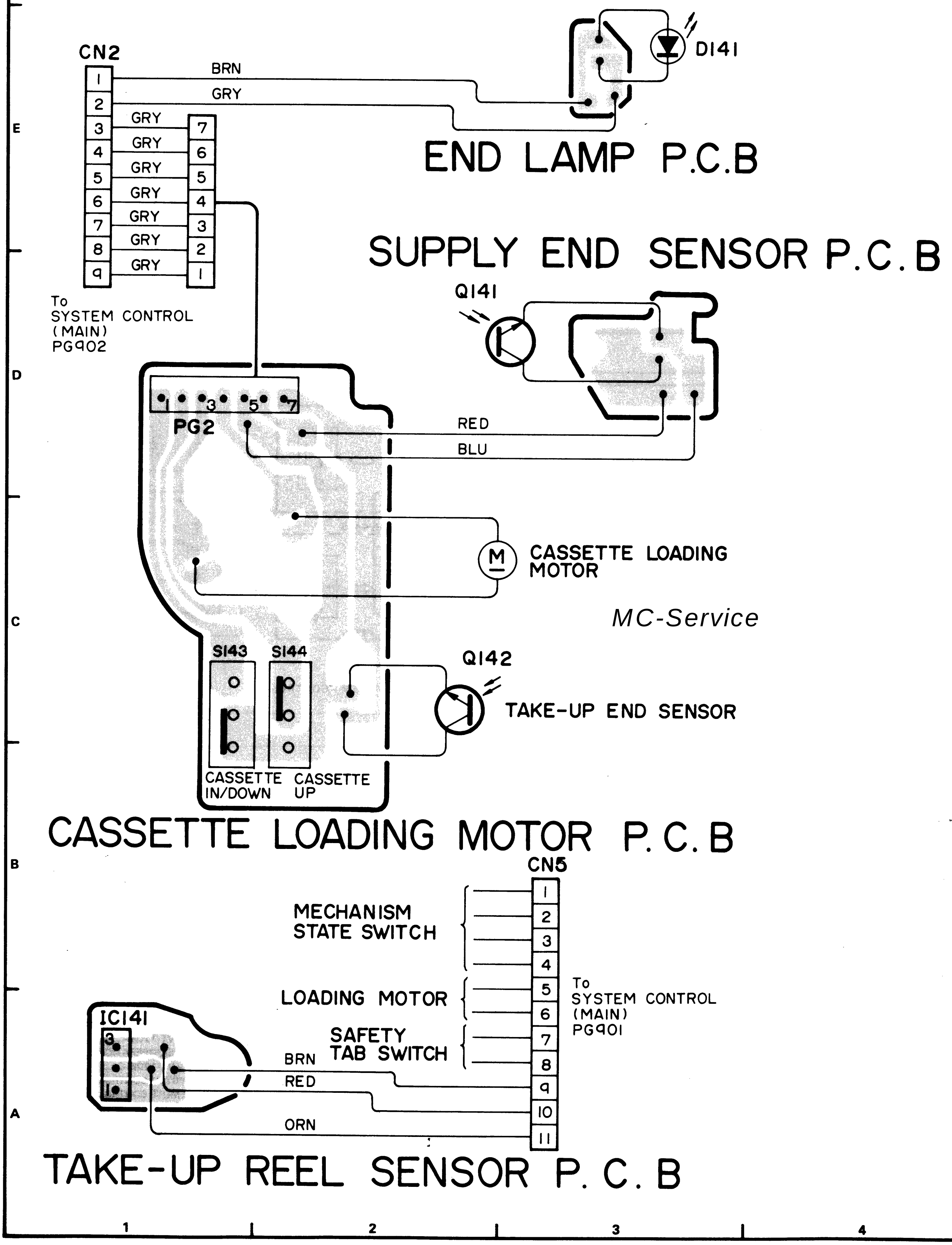
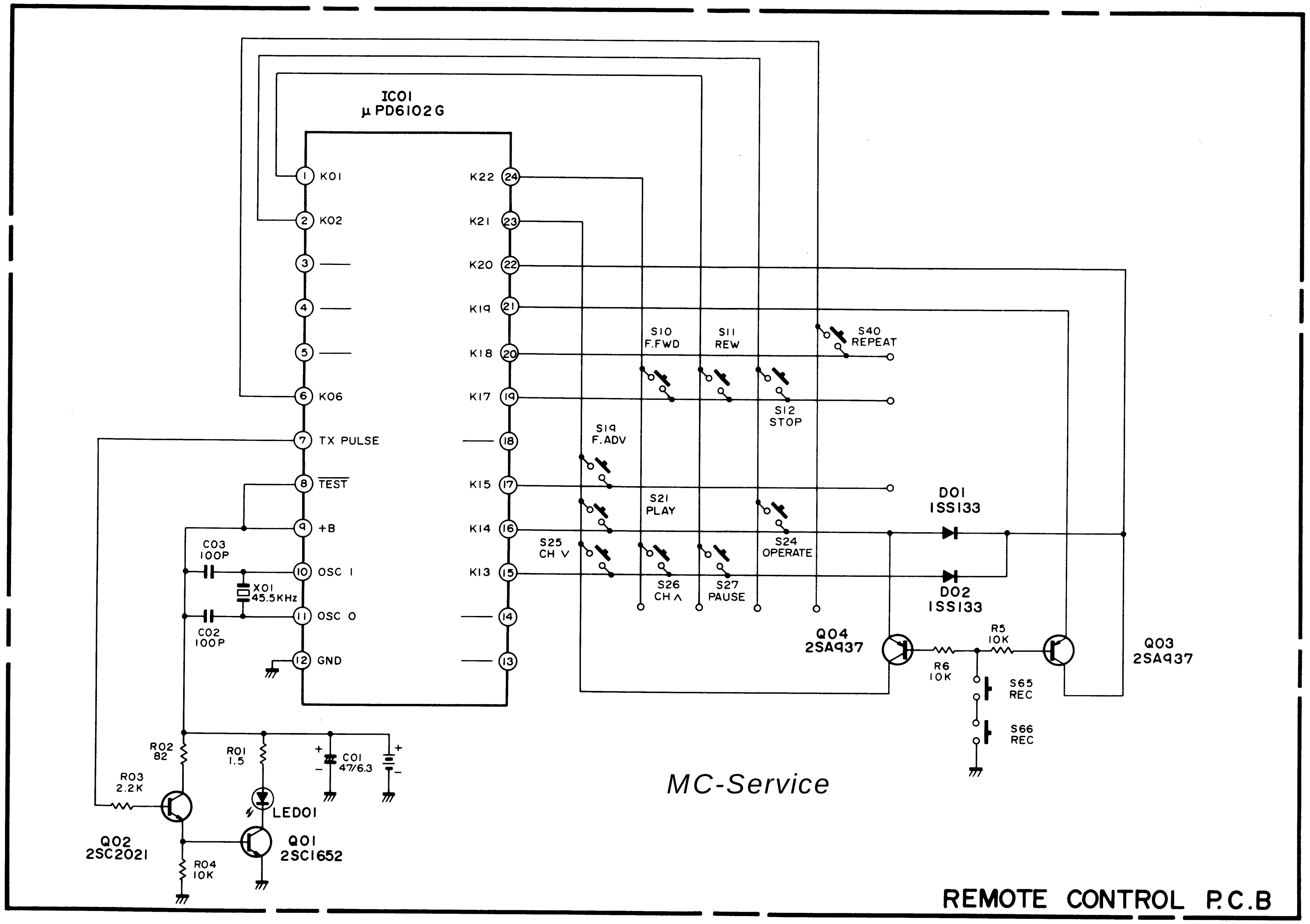
RF CONVERTER	5-29
PREAMP	5-30
SERVO	5-39
Y/CHROMA	5-42
REGULATOR	5-51
INTERNAL WIRING DIAGRAM	5-55

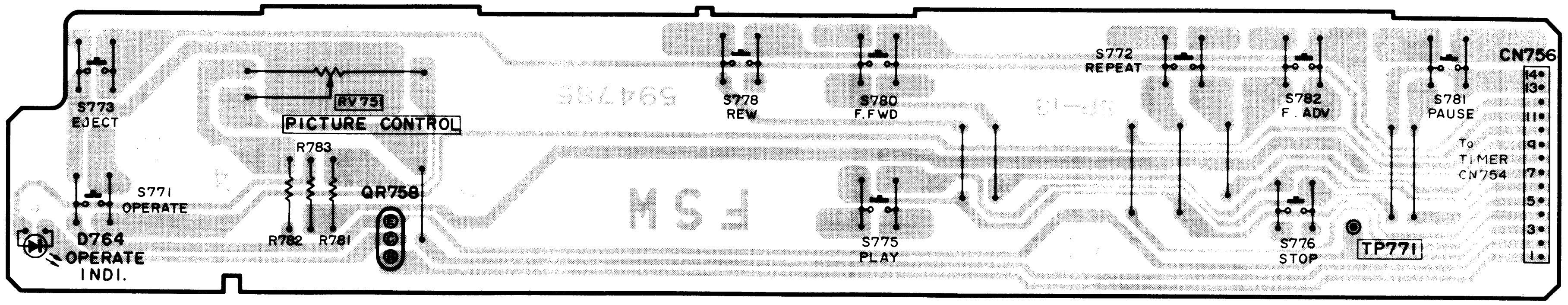
PERIPHERAL BOARD (PERIPHERIE-LEITERPLATTE)


CN2
1
2
3
4
5
6
7
8
9
BRN
GRY
GRY
GRY
GRY
GRY
GRY
GRY
GRY
7
6
5
4
3
2
1
To
SYSTEM CONTROL
(MAIN)
PG902
D141
END LAMP P.C.B
SUPPLY END SENSOR P.C.B
Q141
PG2
1
3
5
7
RED
BLU
M
CASSETTE LOADING
MOTOR
S143
S144
Q142
TAKE-UP END SENSOR
CASSETTE
IN/DOWN
CASSETTE
UP
CASSETTE LOADING MOTOR P.C.B
CN5
1
2
3
4
5
6
7
8
9
10
11
MECHANISM
STATE SWITCH
LOADING MOTOR
SAFETY
TAB SWITCH
To
SYSTEM CONTROL
(MAIN)
PG901
IC141
3
1
BRN
RED
ORN
TAKE-UP REEL SENSOR P.C.B
E
D
C
B
A
1
2
3
4

REMOTE CONTROL/OPERATION SWITCH (FERNBEDIENUNG/FUNKTIONSSCHALTER) – VT-110E –

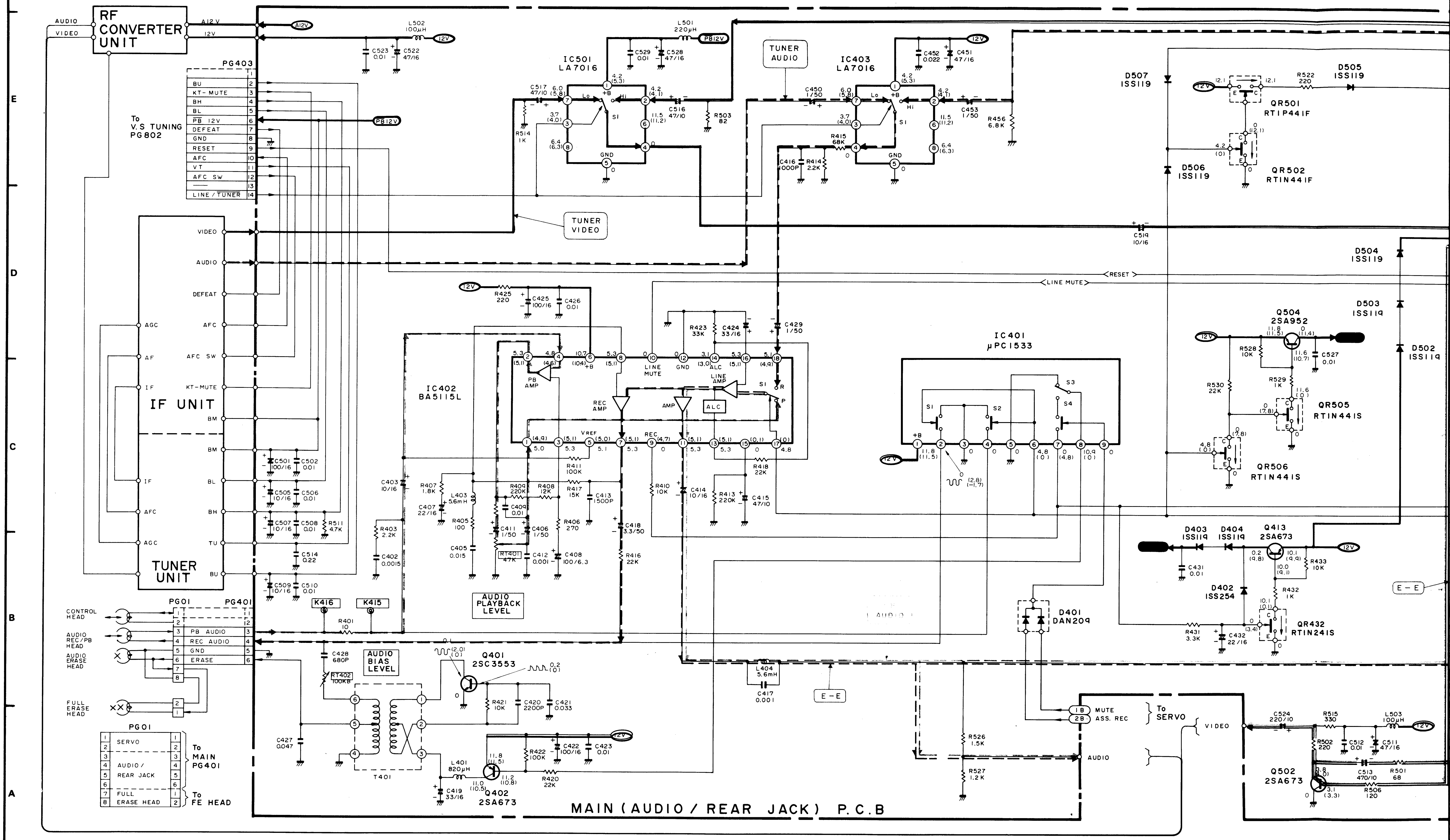

IC01
μPD6102G
1 K01
2 K02
3
4
5
6 K06
7 TX PULSE
8 TEST
9 +B
10 OSC I
11 OSC O
12 GND
K22 24
K21 23
K20 22
K19 21
K18 20
K17 19
18
K15 17
K14 16
K13 15
14
13
C03
100P
X01
45.5KHz
C02
100P
S10
F.FWD
S11
REW
S40
REPEAT
S12
STOP
S19
F.ADV
S21
PLAY
S24
OPERATE
S25
CH ∨
S26
CH ∧
S27
PAUSE
D01
1SS133
D02
1SS133
Q04
2SA937
R5
10K
R6
10K
Q03
2SA937
S65
REC
S66
REC
R02
82
R01
1.5
C01
47/6.3
R03
2.2K
LED01
Q02
2SC2021
Q01
2SC1652
R04
10K

REMOTE CONTROL P.C.B

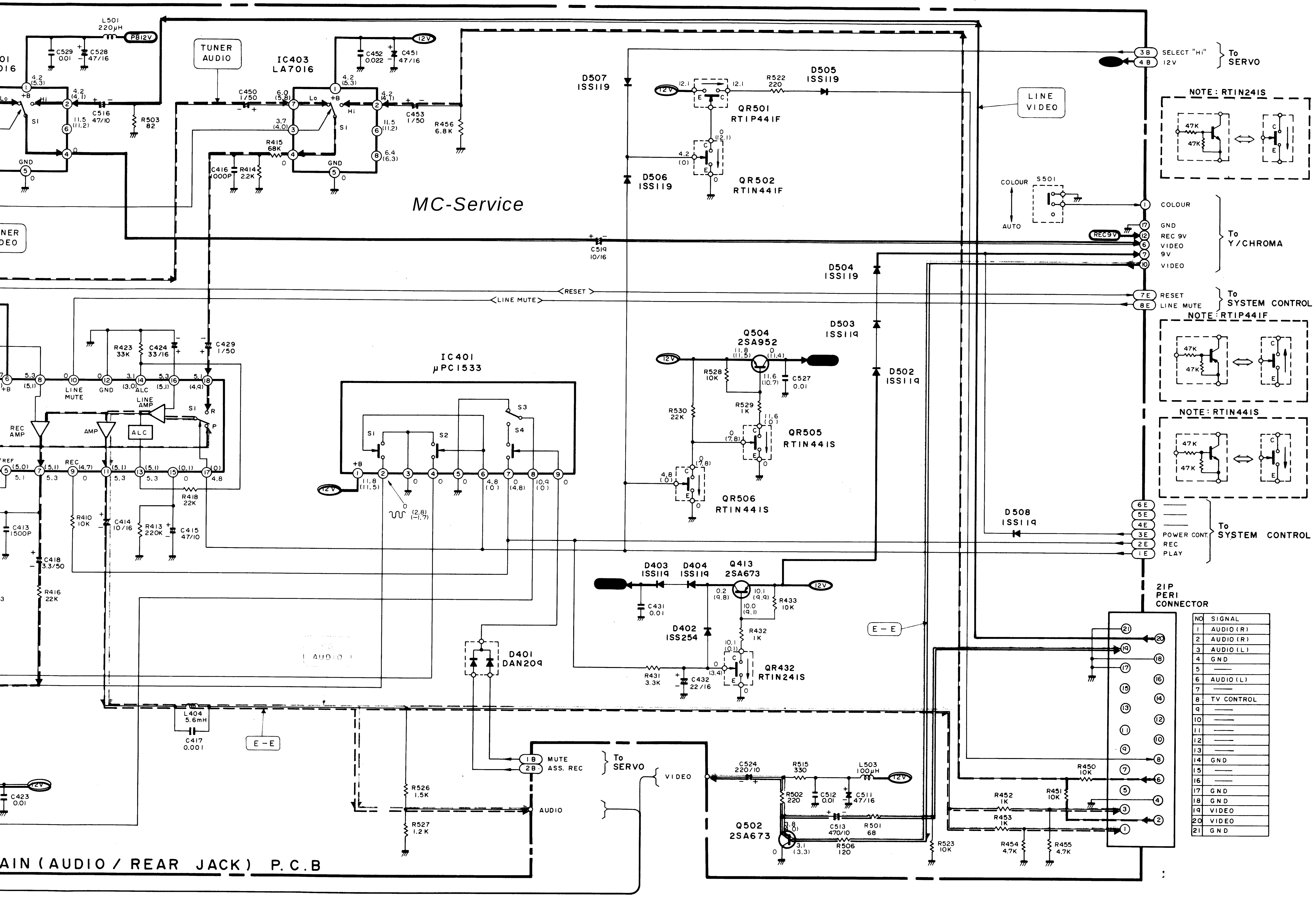

S773
EJECT
RV75
PICTURE CONTROL
R783
S771
OPERATE
QR758
D764
OPERATE
INDI.
R782
R781
S778
REW
S780
F.FWD
S775
PLAY
S772
REPEAT
S782
F. ADV
S781
PAUSE
CN756
To
TIMER
CN754
S776
STOP
TP771

OPERATION SWITCH P.C.B

AUDIO/REAR JACK (AUDIO-BUCHSE)


RF CONVERTER UNIT
AUDIO
VIDEO
A12V
12V
L502 100μH
C523 0.01
C522 47/16
PG403
BU
KT-MUTE
BH
BL
PB 12V
DEFEAT
GND
RESET
AFC
VT
AFC SW
LINE / TUNER
To V.S TUNING PG802
PB12V
IC501 LA7016
L501 220μH
C529 0.01
C528 47/16
C517 47/10
R514 1K
C516 47/10
R503 82
S1
GND
TUNER AUDIO
IC403 LA7016
C450 1/50
C452 0.022
C451 47/16
C453 1/50
R456 6.8K
R415 68K
C416 1000P
R414 2.2K
TUNER VIDEO
C519 10/16
D507 1SS119
D506 1SS119
D505 1SS119
R522 220
QR501 RT1P441F
QR502 RTIN441F
D504 1SS119
D503 1SS119
D502 1SS119
RESET
LINE MUTE
Q504 2SA952
R528 10K
R529 1K
R530 22K
C527 0.01
QR505 RTIN441S
QR506 RTIN441S
IF UNIT
VIDEO
AUDIO
DEFEAT
AGC
AFC
AF
AFC SW
IF
KT-MUTE
BM
BL
BH
TU
BU
TUNER UNIT
C501 100/16
C502 0.01
C505 10/16
C506 0.01
C507 10/16
C508 0.01
R511 4.7K
C514 0.22
C509 10/16
C510 0.01
IC402 BA5115L
R425 220
C425 100/16
C426 0.01
PB AMP
REC AMP
VREF
LINE MUTE
LINE AMP
ALC
AMP
REC
C403 10/16
R407 1.8K
L403 5.6mH
C407 22/16
R405 100
C405 0.015
R403 2.2K
C402 0.0015
R409 220K
C409 0.01
R408 12K
R411 100K
R417 15K
C413 1500P
C411 1/50
C406 1/50
RT401 47K
C412 0.001
R406 270
C408 100/6.3
C418 3.3/50
R416 22K
R423 33K
C424 33/16
C429 1/50
R410 10K
C414 10/16
R413 220K
C415 47/10
R418 22K
AUDIO PLAYBACK LEVEL
IC401 μPC1533
S1
S2
S3
S4
+B
D403 1SS119
D404 1SS119
Q413 2SA673
C431 0.01
R433 10K
D402 1SS254
R432 1K
R431 3.3K
C432 22/16
QR432 RTIN241S
D401 DAN209
E-E
K416
K415
R401 10
CONTROL HEAD
AUDIO REC/PB HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
PG01
PG401
PB AUDIO
REC AUDIO
GND
ERASE
C428 680P
RT402 100KB
AUDIO BIAS LEVEL
Q401 2SC3553
R421 10K
C420 2200P
C421 0.033
C427 0.047
T401
L401 820μH
Q402 2SA673
C419 33/16
R422 100K
C422 100/16
C423 0.01
R420 22K
L404 5.6mH
C417 0.001
R526 1.5K
R527 1.2K
MUTE
ASS. REC
To SERVO
AUDIO
VIDEO
C524 220/10
R515 330
L503 100μH
R502 220
C512 0.01
C511 47/16
C513 470/10
R501 68
R506 120
Q502 2SA673
PG01
SERVO
AUDIO / REAR JACK
FULL ERASE HEAD
To MAIN PG401
To FE HEAD
MAIN (AUDIO / REAR JACK) P.C.B

※ ONE VOLTAGE : PB OR REC MODE, TWO VOLTAGES : PB AND (REC) MODES.


IC403
LA7016
TUNER AUDIO
L501 220μH
PB12V
C529 0.01
C528 47/16
C516 47/10
R503 82
C450 1/50
C452 0.022
C451 47/16
C453 1/50
R456 6.8K
R415 68K
C416 1000P
R414 2.2K
S1
GND
D507 1SS119
D505 1SS119
R522 220
QR501 RT1P441F
QR502 RTIN441F
D506 1SS119
LINE VIDEO
C519 10/16
RESET
LINE MUTE
R423 33K
C424 33/16
C429 1/50
LINE MUTE
LINE AMP
REC AMP
AMP
ALC
IC401
μPC1533
S1 S2 S3 S4
R418 22K
R410 10K
C414 10/16
R413 220K
C415 47/10
C413 1500P
C418 3.3/50
R416 22K
C423 0.01
L404 5.6mH
C417 0.001
E-E
D504 1SS119
D503 1SS119
D502 1SS119
Q504 2SA952
R528 10K
C527 0.01
R530 22K
R529 1K
QR505 RTIN441S
QR506 RTIN441S
D403 1SS119
D404 1SS119
Q413 2SA673
C431 0.01
R433 10K
D402 1SS254
R432 1K
R431 3.3K
C432 22/16
QR432 RTIN241S
D401 DAN209
R526 1.5K
R527 1.2K
MUTE
ASS. REC
AUDIO
To SERVO
VIDEO
C524 220/10
R515 330
L503 100μH
R502 220
C512 0.01
C511 47/16
Q502 2SA673
C513 470/10
R501 68
R506 120
R523 10K
D508 1SS119
SELECT "Hi"
12V
To SERVO
NOTE: RTIN241S
NOTE: RTIP441F
NOTE: RTIN441S
47K
COLOUR
AUTO
S501
COLOUR
GND
REC 9V
VIDEO
9V
VIDEO
To Y/CHROMA
RESET
LINE MUTE
To SYSTEM CONTROL
POWER CONT.
REC
PLAY
To SYSTEM CONTROL
21P PERI CONNECTOR
R450 10K
R451 10K
R452 1K
R453 1K
R454 4.7K
R455 4.7K
4 5 6 7 8 9 10 11

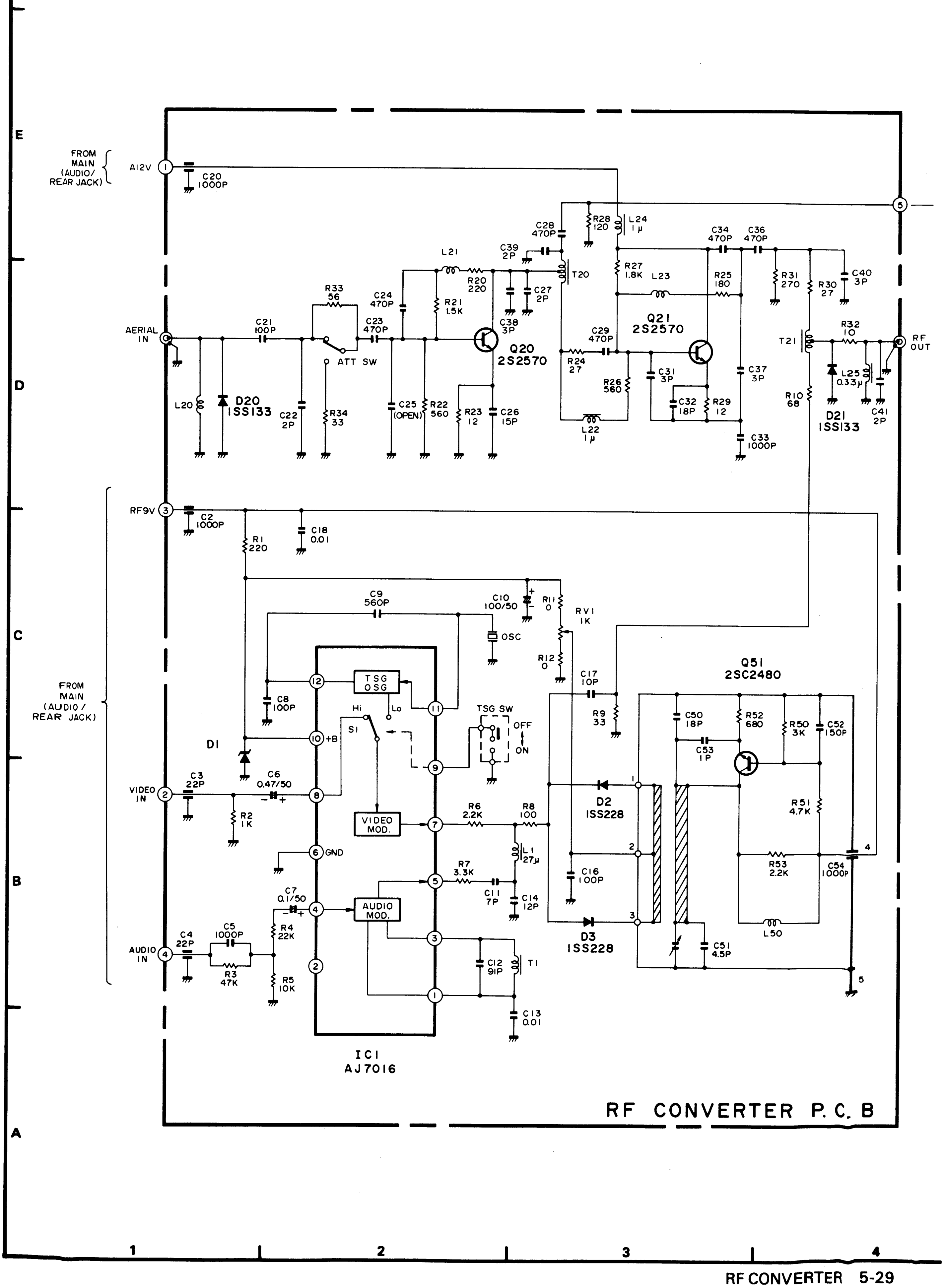
NO	SIGNAL
1	AUDIO (R)
2	AUDIO (R)
3	AUDIO (L)
4	GND
5	——
6	AUDIO (L)
7	——
8	TV CONTROL
9	——
10	——
11	——
12	——
13	——
14	GND
15	——
16	——
17	GND
18	GND
19	VIDEO
20	VIDEO
21	GND

AIN (AUDIO / REAR JACK) P.C.B

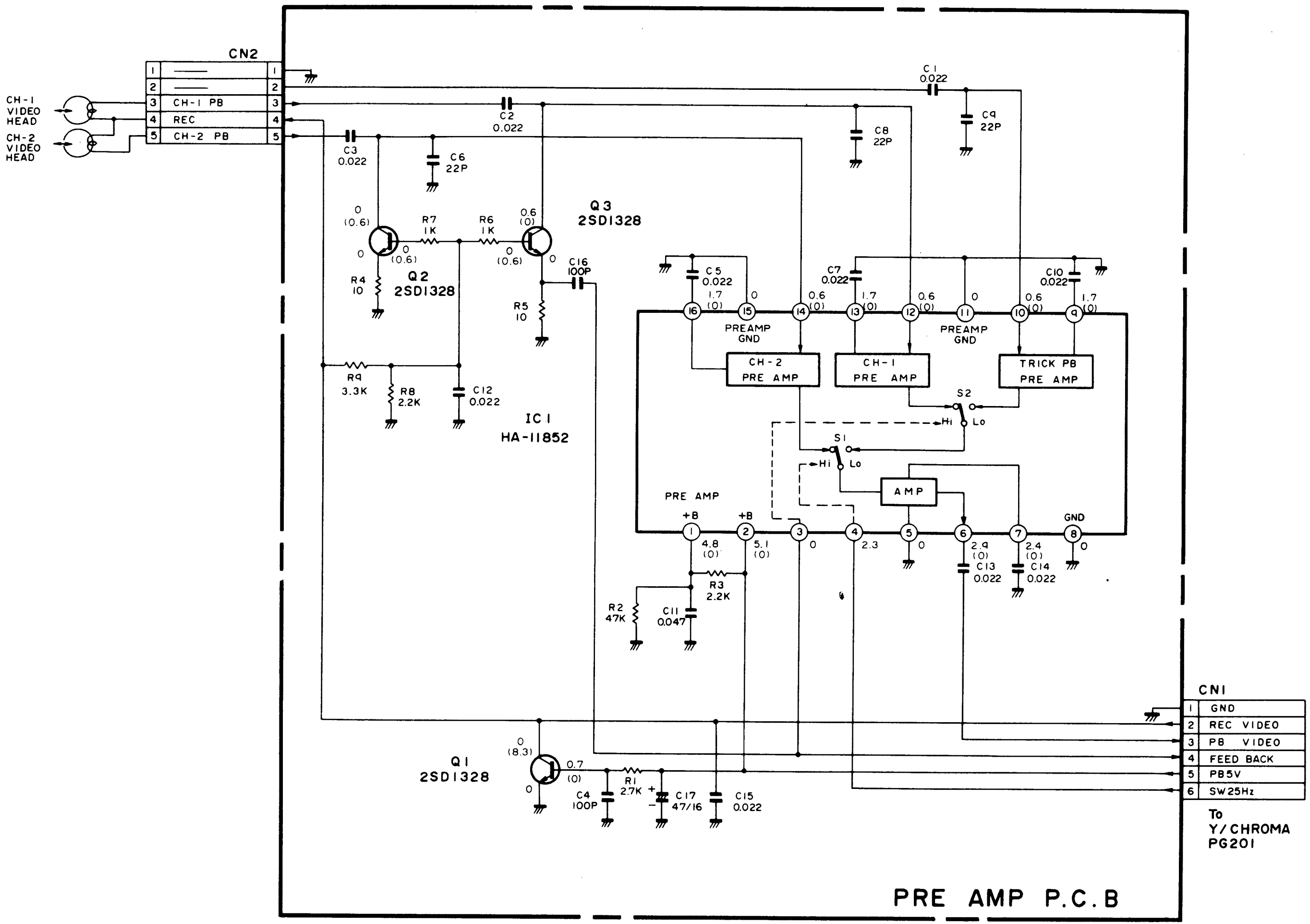
E, TWO VOLTAGES : PB AND (REC) MODES.

SCHEMATIC DIAGRAM	PAGE
TUNER UNIT	5-2
IF UNIT	5-3
V-S TUNING	5-5
TIMER/OPERATION SWITCH – VT-110E –	5-11
TIMER/OPERATION SWITCH – VT-120E –	5-14
SYSTEM CONTROL	5-20
REMOTE CONTROL	5-24
AUDIO/REAR JACK	5-26
RF CONVERTER	5-29
PREAMP	5-30
SERVO	5-39
Y/CHROMA	5-42
REGULATOR	5-51
INTERNAL WIRING DIAGRAM	5-55

RF CONVERTER (HF-KONVERTER)


E
D
C
B
A
1
2
3
4
FROM MAIN (AUDIO/ REAR JACK)
A12V
C20 1000P
5
R28 120
L24 1μ
C28 470P
C39 2P
T20
L21
R20 220
C27 2P
R27 1.8K
L23
C34 470P
C36 470P
R31 270
R30 27
C40 3P
R33 56
C24 470P
R21 1.5K
C38 3P
R25 180
AERIAL IN
C21 100P
C23 470P
Q20 2S2570
C29 470P
Q21 2S2570
R32 10
T21
RF OUT
ATT SW
R24 27
R26 560
C31 3P
C37 3P
L25 0.33μ
L20
D20 1SS133
C22 2P
R34 33
C25 (OPEN)
R22 560
R23 12
C26 15P
C32 18P
R29 12
R10 68
D21 1SS133
C41 2P
L22 1μ
C33 1000P
RF9V
C2 1000P
C18 0.01
R1 220
C9 560P
C10 100/50
R11 0
RV1 1K
OSC
R12 0
FROM MAIN (AUDIO / REAR JACK)
Q51 2SC2480
C17 10P
TSG OSG
TSG SW
C8 100P
Hi
Lo
S1
+B
OFF
ON
R9 33
C50 18P
R52 680
R50 3K
C52 150P
C53 1P
D1
VIDEO IN
C3 22P
C6 0.47/50
VIDEO MOD.
R6 2.2K
R8 100
D2 1SS228
R51 4.7K
R2 1K
GND
L1 27μ
R53 2.2K
C54 1000P
R7 3.3K
C16 100P
C7 0.1/50
AUDIO MOD.
C11 7P
C14 12P
L50
C4 22P
C5 1000P
R4 22K
D3 1SS228
C51 4.5P
AUDIO IN
R3 47K
R5 10K
C12 91P
T1
C13 0.01
IC1 AJ7016
RF CONVERTER P.C.B

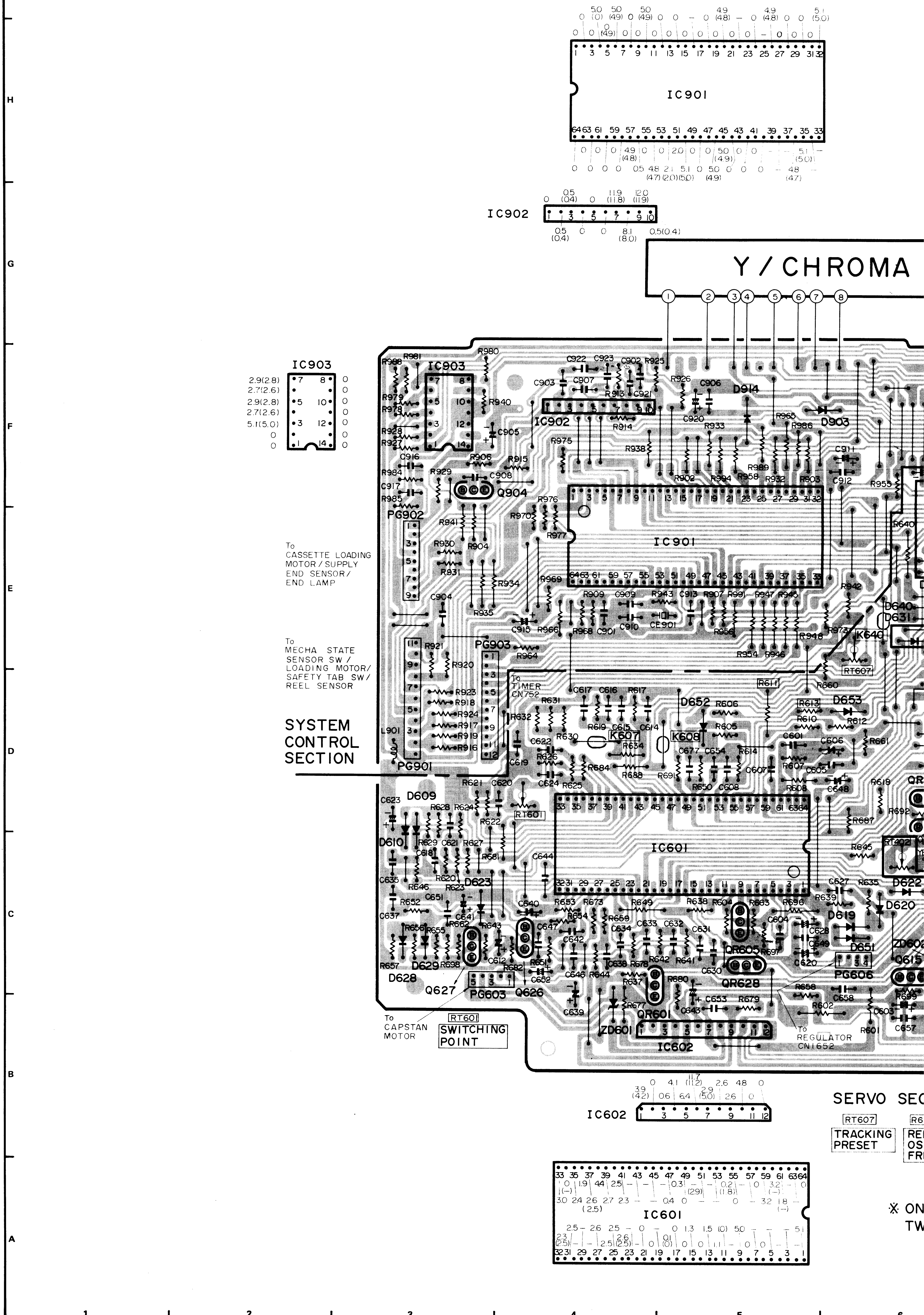
PREAMP (CORVERSTÄRKER)


CN2
1
2
3 CH-1 PB
4 REC
5 CH-2 PB
CH-1 VIDEO HEAD
CH-2 VIDEO HEAD
C1 0.022
C2 0.022
C3 0.022
C6 22P
C8 22P
C9 22P
Q3 2SD1328
Q2 2SD1328
R7 1K
R6 1K
R4 10
R5 10
C16 100P
R9 3.3K
R8 2.2K
C12 0.022
IC1 HA-11852
C5 0.022
C7 0.022
C10 0.022
PREAMP GND
CH-2 PRE AMP
CH-1 PRE AMP
TRICK PB PRE AMP
S2
S1
Hi
Lo
AMP
PRE AMP
+B
GND
R3 2.2K
R2 47K
C11 0.047
C13 0.022
C14 0.022
Q1 2SD1328
C4 100P
R1 2.7K
C17 47/16
C15 0.022
CN1
1 GND
2 REC VIDEO
3 PB VIDEO
4 FEED BACK
5 PB5V
6 SW25Hz
To Y/CHROMA PG201
PRE AMP P.C.B

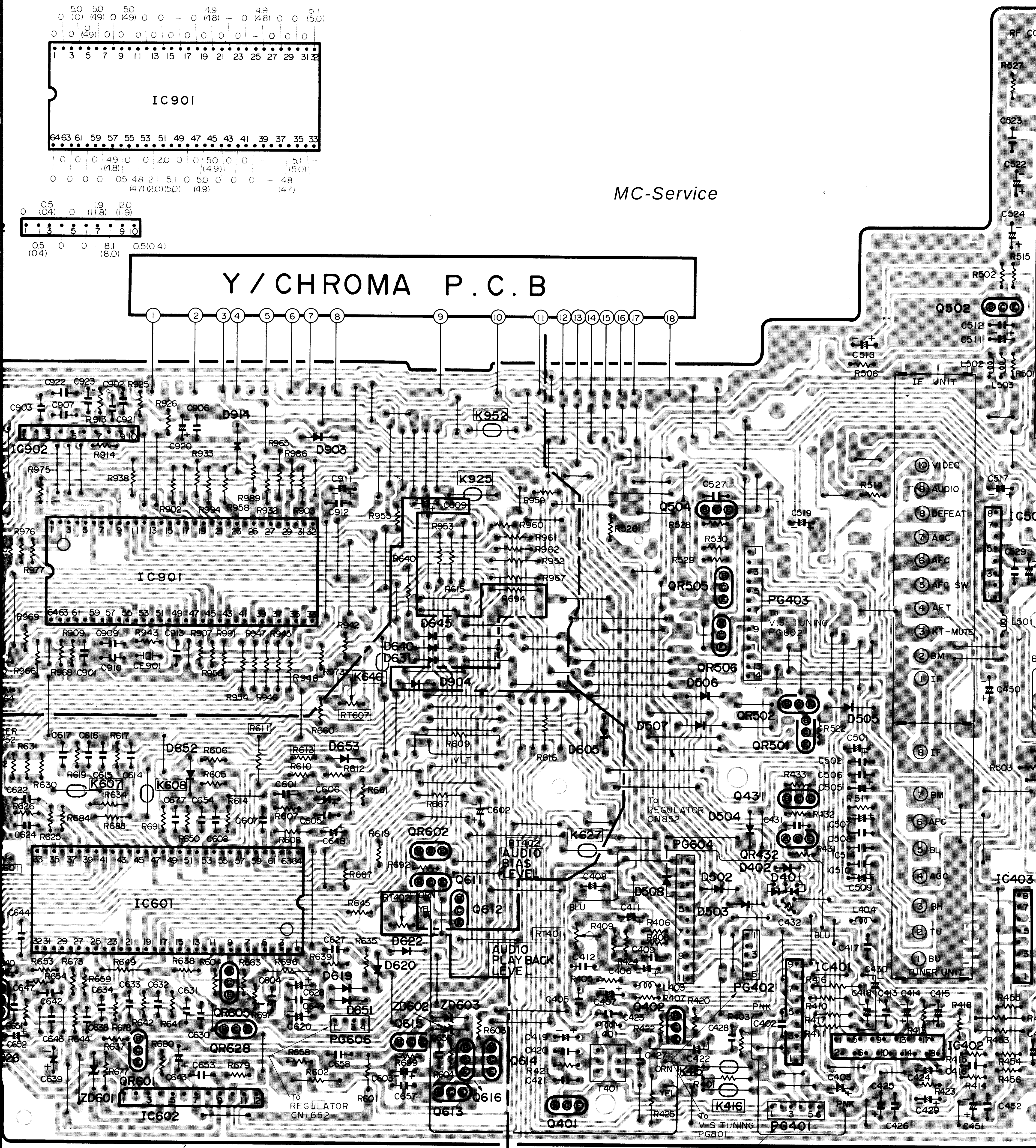
※ONE VOLTAGE : PB OR REC MODE,
TWO VOLTAGES : PB AND (REC) MODE.

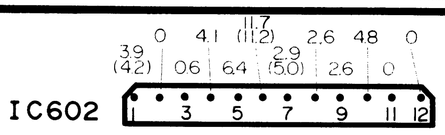
SCHEMATIC DIAGRAM	PAGE
TUNER UNIT	5-2
IF UNIT	5-3
V·S TUNING	5-5
TIMER/OPERATION SWITCH -VT-110E-	5-11
TIMER/OPERATION SWITCH -VT-120E-	5-14
SYSTEM CONTROL	5-20
REMOTE CONTROL	5-24
AUDIO/REAR JACK	5-26
RF CONVERTER	5-29
PREAMP	5-30
SERVO	5-39
Y/CHROMA	5-42
REGULATOR	5-51
INTERNAL WIRING DIAGRAM	5-55

MAIN (HAUPT)



IC901
IC902
IC903
IC601
IC602
Y / CHROMA
SYSTEM CONTROL SECTION
To CASSETTE LOADING MOTOR / SUPPLY END SENSOR / END LAMP
To MECHA STATE SENSOR SW / LOADING MOTOR / SAFETY TAB SW / REEL SENSOR
To TIMER CN752
To CAPSTAN MOTOR
RT601 SWITCHING POINT
To REGULATOR CN1652
SERVO SEC
RT607 TRACKING PRESET
RE OS FR
※ ON TW
PG901
PG902
PG903
PG603
PG606
Q904
Q626
Q627
QR601
QR605
QR628
ZD601
K607
K608
K640
D609
D610
D623
D628
D629
D652
D653
D903
D914
A
B
C
D
E
F
G
H
1
2
3
4
5


IC901
Y/CHROMA P.C.B
IC902
IC601
IC602
IC401
IC402
IC403
Q502
Q504
Q431
Q401
Q402
Q611
Q612
Q613
Q614
Q615
Q616
QR505
QR506
QR502
QR501
QR432
QR602
QR605
QR628
QR601
D914
D903
D904
D645
D640
D631
D652
D653
D605
D506
D507
D505
D504
D502
D503
D508
D402
D401
D622
D619
D620
D651
ZD602
ZD603
ZD601
K952
K925
K640
K607
K608
K627
K415
K416
RT607
RT402
RT401
PG403
PG604
PG402
PG606
PG401
AUDIO BIAS LEVEL
AUDIO PLAY BACK LEVEL
To V.S TUNING PG802
To REGULATOR CN852
To REGULATOR CN1652
To V.S TUNING PG801
IF UNIT
TUNER UNIT
⑩ VIDEO
⑨ AUDIO
⑧ DEFEAT
⑦ AGC
⑥ AFC
⑤ AFC SW
④ AFT
③ KT-MUTE
② BM
① IF
⑧ IF
⑦ BM
⑥ AFC
⑤ BL
④ AGC
③ BH
② TU
① BU
RF CO
T401
VLT
ORN
YEL
BLU
PNK


IC602

SERVO SECTION

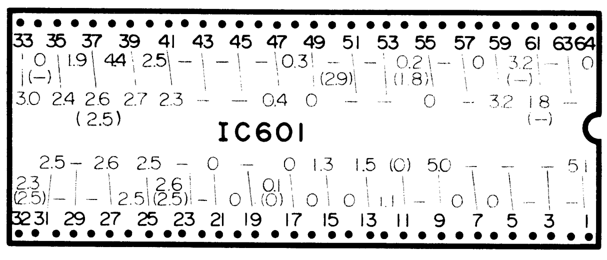
RT607 TRACKING PRESET

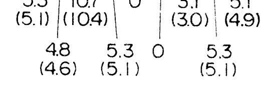
R610, R611 REFERENCE OSCILLATION FREQUENCY

AUDIO/REAR JACK SECTION

To CONTROL HEAD/ AUDIO (REC/PB, ERASE) HEAD/ FULL ERASE HEAD.

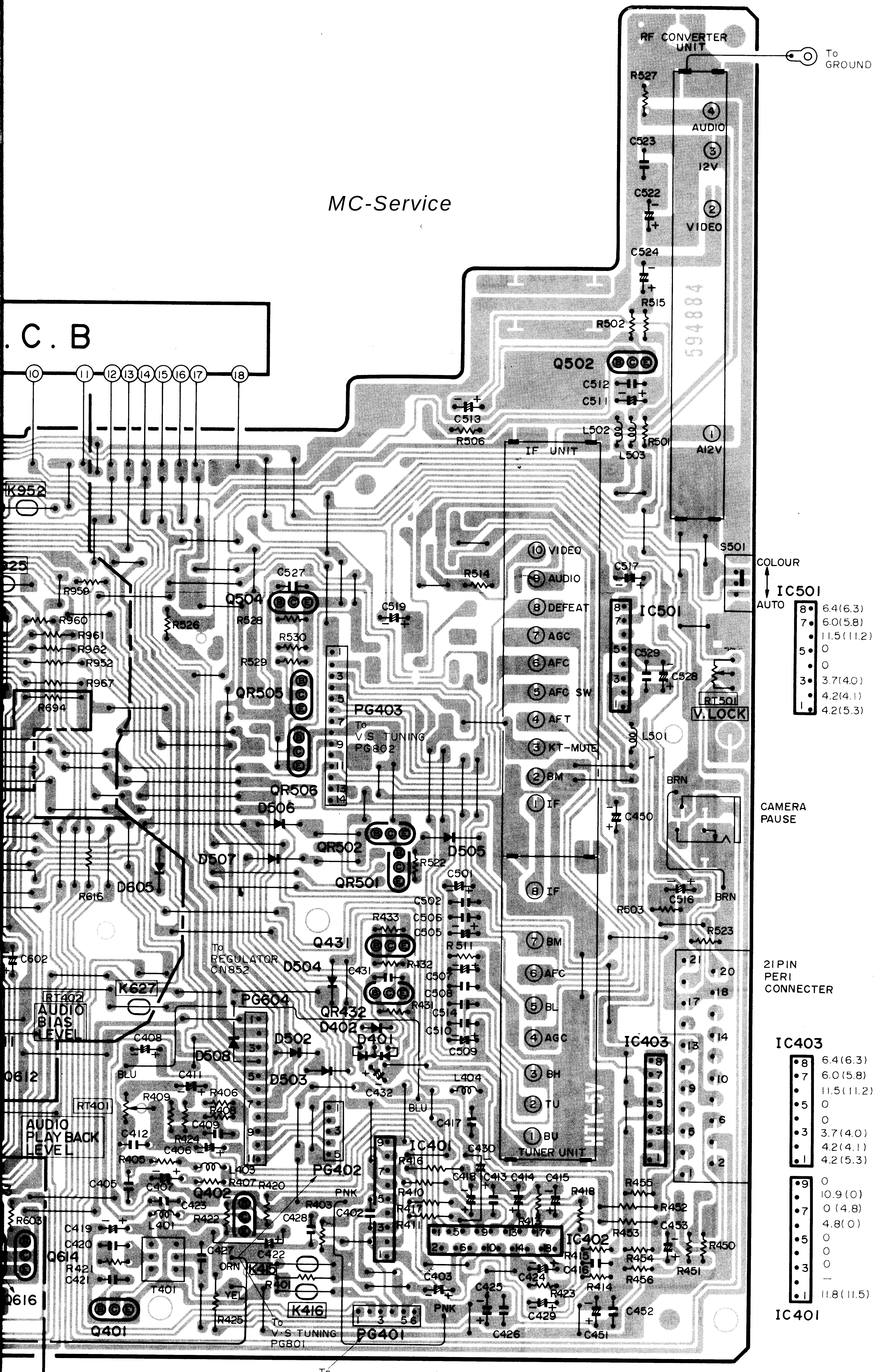
MAIN P.C


IC601


IC402

※ ONE VOLTAGE : PB OR REC MODE.
TWO VOLTAGES: PB AND (REC) MODES.

4 5 6 7 8 9


RF CONVERTER UNIT
To GROUND
④ AUDIO
③ 12V
② VIDEO
① A12V
594884
IF UNIT
⑩ VIDEO
⑨ AUDIO
⑧ DEFEAT
⑦ AGC
⑥ AFC
⑤ AFC SW
④ AFT
③ KT-MUTE
② BM
① IF
TUNER UNIT
S501
COLOUR
AUTO
RT501 V.LOCK
CAMERA PAUSE
BRN
21PIN PERI CONNECTER
PG403 To V.S TUNING PG802
To REGULATOR CN852
RT402 AUDIO BIAS LEVEL
RT401 AUDIO PLAY BACK LEVEL
PG401 To V.S TUNING PG801
PG402
PG604
IC401
IC402
IC403
IC501
Q401
Q402
Q431
Q502
Q504
QR432
QR501
QR502
QR505
QR506
To CONTROL HEAD / AUDIO (REC/PB, ERASE) HEAD / FULL ERASE HEAD.

IC501

Pin	Voltage
8	6.4(6.3)
7	6.0(5.8)
	11.5(11.2)
5	0
	0
3	3.7(4.0)
	4.2(4.1)
1	4.2(5.3)

IC403

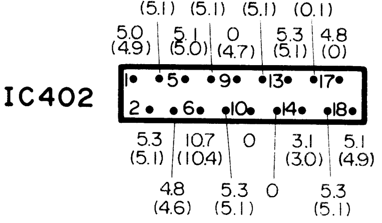
Pin	Voltage
8	6.4(6.3)
7	6.0(5.8)
	11.5(11.2)
5	0
	0
3	3.7(4.0)
	4.2(4.1)
1	4.2(5.3)

IC401

Pin	Voltage
9	0
	10.9(0)
7	0(4.8)
	4.8(0)
5	0
	0
3	0
	—
1	11.8(11.5)

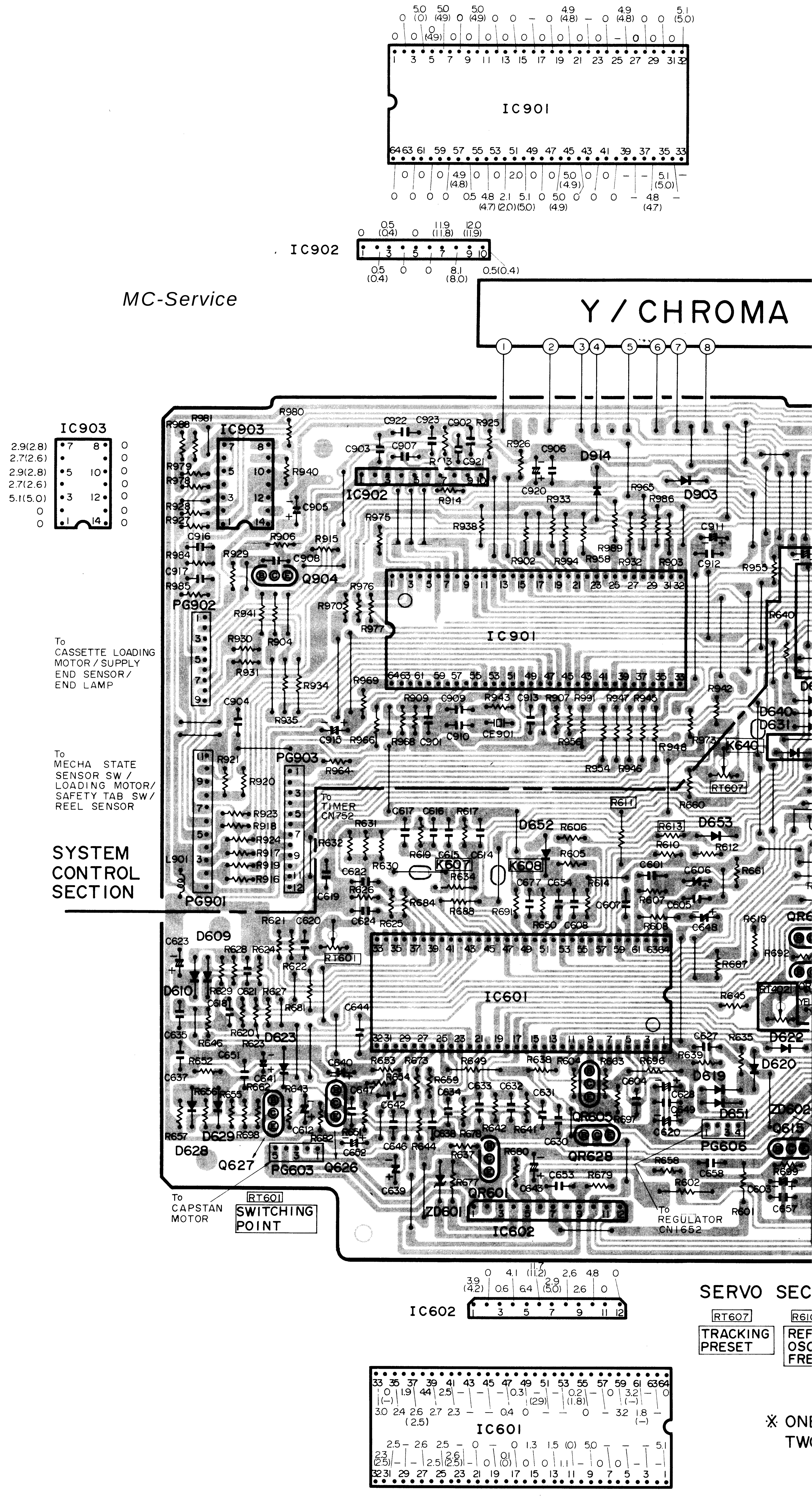
AUDIO / REAR JACK SECTION

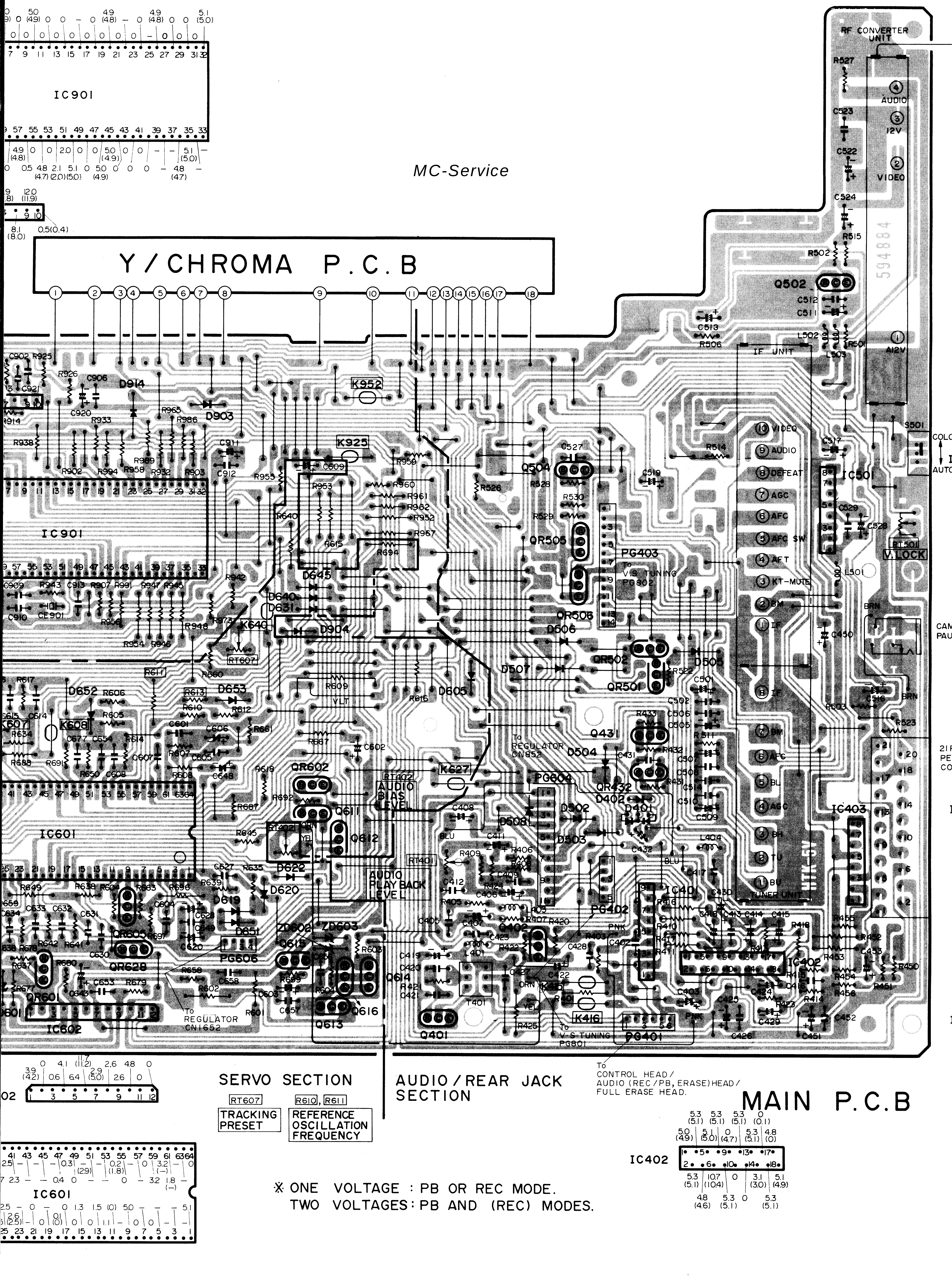
MAIN P.C.B


5.3 (5.1)
5.3 (5.1)
5.3 (5.1)
0 (0.1)
5.0 (4.9)
5.1 (5.0)
0 (4.7)
5.3 (5.1)
4.8 (0)
IC402
1 5 9 13 17
2 6 10 14 18
5.3 (5.1)
10.7 (10.4)
0
3.1 (3.0)
5.1 (4.9)
4.8 (4.6)
5.3 (5.1)
0
5.3 (5.1)

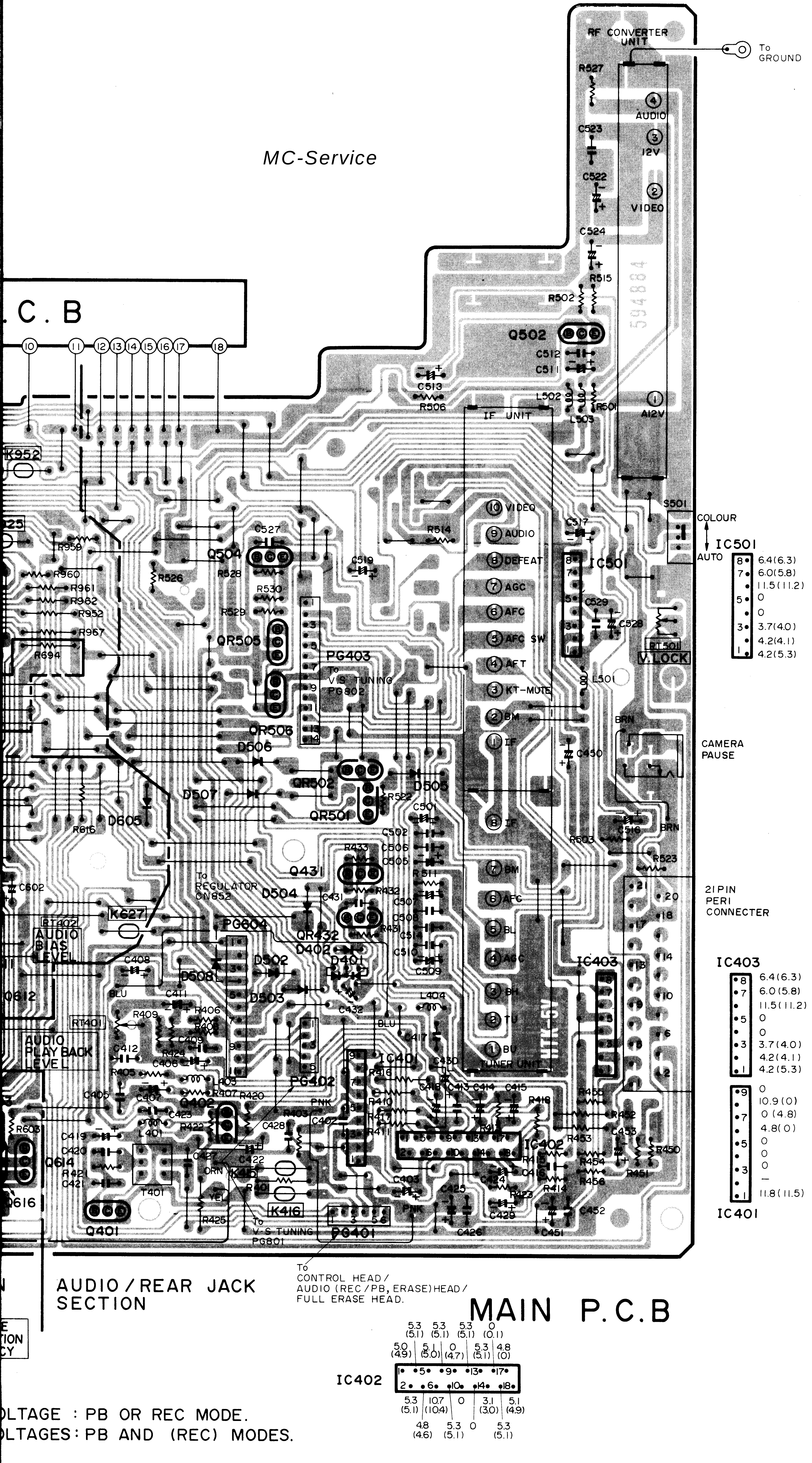
LTAGE : PB OR REC MODE.
LTAGES : PB AND (REC) MODES.

MAIN (HAUPT)


IC901
IC902
IC903
Y / CHROMA
To CASSETTE LOADING MOTOR / SUPPLY END SENSOR / END LAMP
To MECHA STATE SENSOR SW / LOADING MOTOR / SAFETY TAB SW / REEL SENSOR
To TIMER CN752
SYSTEM CONTROL SECTION
To CAPSTAN MOTOR
RT601 SWITCHING POINT
To REGULATOR CN1652
IC601
IC602
SERVO SEC
RT607 TRACKING PRESET
R61 REF OSC FRE
※ ON TW
PG901
PG902
PG903
PG603
PG606
Q904
Q626
Q627
QR601
QR605
QR628
D903
D914
D609
D610
D623
D628
D629
D652
D653
D619
D620
D622
D651
ZD601
K607
K608
K640
RT601
RT607
H
G
F
E
D
C
B
A
1
2
3
4
5
6


IC901
Y/CHROMA P.C.B
RF CONVERTER UNIT
AUDIO
12V
VIDEO
A12V
IF UNIT
TUNER UNIT
IC501
IC601
IC602
IC401
IC402
IC403
PG403
PG404
PG402
PG401
PG606
To V/S TUNING PG802
To REGULATOR CN852
To REGULATOR CN1652
To V/S TUNING PG801
RT607
RT402 AUDIO BIAS LEVEL
RT401 AUDIO PLAY BACK LEVEL
RT501 V.LOCK
To CONTROL HEAD/ AUDIO (REC/PB, ERASE) HEAD/ FULL ERASE HEAD.
SERVO SECTION
RT607 TRACKING PRESET
R610, R611 REFERENCE OSCILLATION FREQUENCY
AUDIO / REAR JACK SECTION
MAIN P.C.B
5
6
7
8
9
10

※ ONE VOLTAGE : PB OR REC MODE.
TWO VOLTAGES : PB AND (REC) MODES.



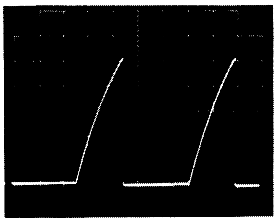
RF CONVERTER UNIT
To GROUND
R527
④ AUDIO
C523
③ 12V
C522
② VIDEO
C524
R515
R502
Q502
C512
C511
C513
R506
L502
R501
L503
① A12V
IF UNIT
.C. B
10
11
12
13
14
15
16
17
18
K952
Q504
C527
R528
R530
R529
R526
QR505
PG403
To V.S TUNING PG802
QR506
D506
D507
QR502
QR501
R522
D505
R514
C519
⑩ VIDEO
⑨ AUDIO
⑧ DEFEAT
⑦ AGC
⑥ AFC
⑤ AFC SW
④ AFT
③ KT-MUTE
② BM
① IF
C517
IC501
C529
C528
S501
COLOUR
AUTO
RT501
V.LOCK
L501
BRN
C450
CAMERA PAUSE
C516
R503
R523
21PIN PERI CONNECTER
21
20
18
17
14
10
6
2
IC403
R959
R960
R961
R962
R952
R967
R694
R616
D605
C602
To REGULATOR CN852
D504
Q431
C431
R433
R432
R431
QR432
D402
D401
PG604
K627
RT402
AUDIO BIAS LEVEL
C408
D508
D502
D503
BLU
C411
R409
R406
RT401
AUDIO PLAY BACK LEVEL
C409
C412
R405
C406
L403
C405
C407
R407
R420
PG402
Q402
C425
R422
L401
C419
C420
C421
R421
Q614
Q616
R603
T401
ORN
K415
YEL
R425
K416
Q401
To V.S TUNING PG801
PG401
PNK
C428
C422
C427
R403
C402
R410
R411
R416
IC401
C430
C432
L404
C417
C501
C502
C506
C505
R511
C507
C508
C510
C509
⑧ IF
⑦ BM
⑥ AFC
⑤ BL
④ AGC
③ BH
② TU
① BU
TUNER UNIT
UHF-5V
C418
C413
C414
C415
R418
R455
R452
C453
R453
IC402
R454
R456
R450
R451
C424
C416
R414
R423
C403
C426
C429
C451
C452
594884
To CONTROL HEAD/ AUDIO (REC/PB, ERASE) HEAD/ FULL ERASE HEAD.
AUDIO / REAR JACK SECTION
MAIN P.C.B
IC501
8 6.4(6.3)
7 6.0(5.8)
11.5(11.2)
5 0
0
3 3.7(4.0)
4.2(4.1)
1 4.2(5.3)
IC403
8 6.4(6.3)
7 6.0(5.8)
11.5(11.2)
5 0
0
3 3.7(4.0)
4.2(4.1)
1 4.2(5.3)
9 0
10.9(0)
7 0(4.8)
4.8(0)
5 0
0
3 0
–
1 11.8(11.5)
IC401
IC402
1 5.0 (4.9)
5 5.1 (5.0)
9 0 (4.7)
13 5.3 (5.1)
17 4.8 (0)
5.3 (5.1)
5.3 (5.1)
5.3 (5.1)
0 (0.1)
2 5.3 (5.1)
6 10.7 (10.4)
10 0
14 3.1 (3.0)
18 5.1 (4.9)
4.8 (4.6)
5.3 (5.1)
0
5.3 (5.1)
E
TION
CY

LTAGE : PB OR REC MODE.
LTAGES : PB AND (REC) MODES.

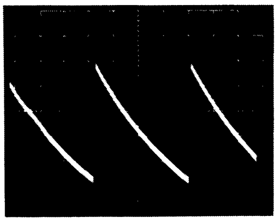
SERVO CIRCUIT WAVEFORMS (WELLENFORM)

[IC601] **(REC: Colour bar Video in/PB: Alignment tape)**

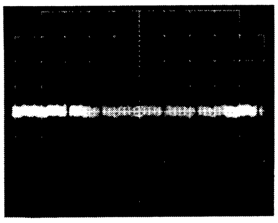
① PIN2 REC/PB
0.5V/10ms. div.



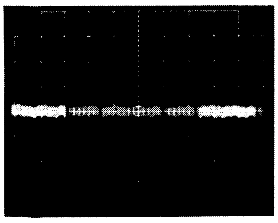
② PIN3 REC/PB
0.1V/10ms. div.



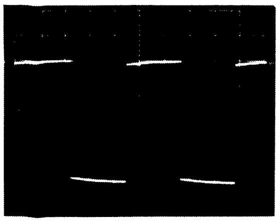
③ PIN4 REC/PB
50mV/10ms. div.



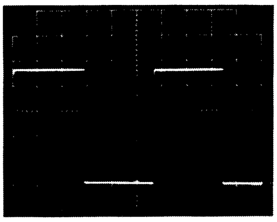
④ PIN5 REC/PB
50mV/10ms. div.



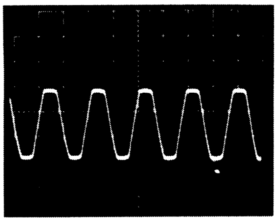
⑤ PIN11 REC/PB
1V/0.2ms. div.



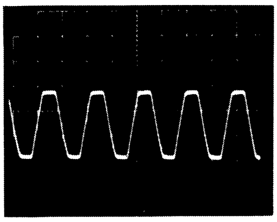
⑥ PIN22 REC/PB
1V/20μs. div.



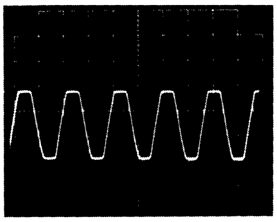
⑦ PIN28 REC/PB
0.5V/1ms. div.



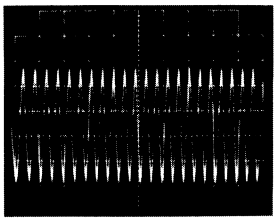
⑧ PIN29 REC/PB
0.5V/1ms. div.



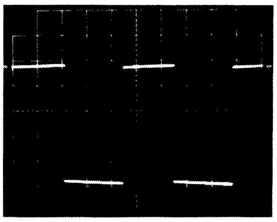
⑨ PIN30 REC/PB
1V/1ms. div.



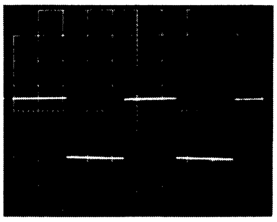
⑩ PIN32 REC/PB
50mV/0.5μs. div.



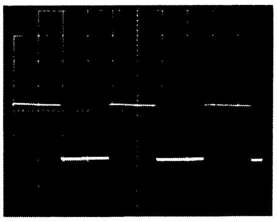
⑪ PIN42 REC/PB
1V/0.1ms. div.



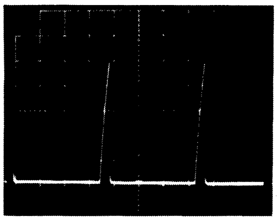
⑫ PIN43 REC/PB
2V/0.1ms. div.



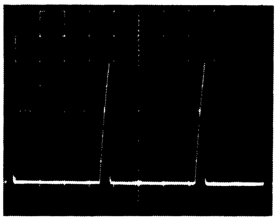
⑬ PIN44 REC/PB
2V/10ms. div.



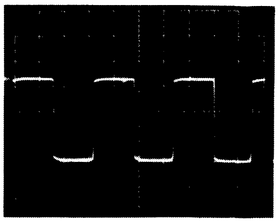
⑭ PIN45 REC/PB
0.5V/5ms. div.



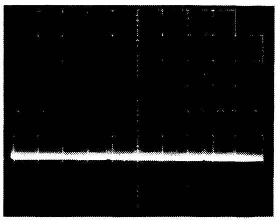
⑮ PIN46 REC/PB
0.5V/5ms. div.



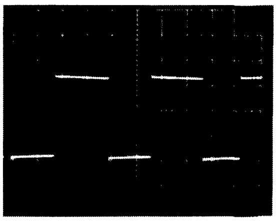
⑯ PIN50 REC/PB
1V/1ms. div.



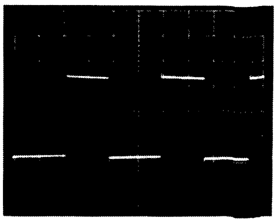
⑰ PIN53 REC/PB
1V/5ms. div.



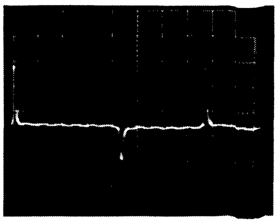
⑱ PIN59 REC
1V/10ms. div.



⑲ PIN60 REC
1V/10ms. div.

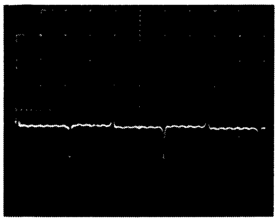


⑳ PIN62 PB
1V/5ms. div.



[IC601]

㉑ PIN63 PB
1V/10ms. div.



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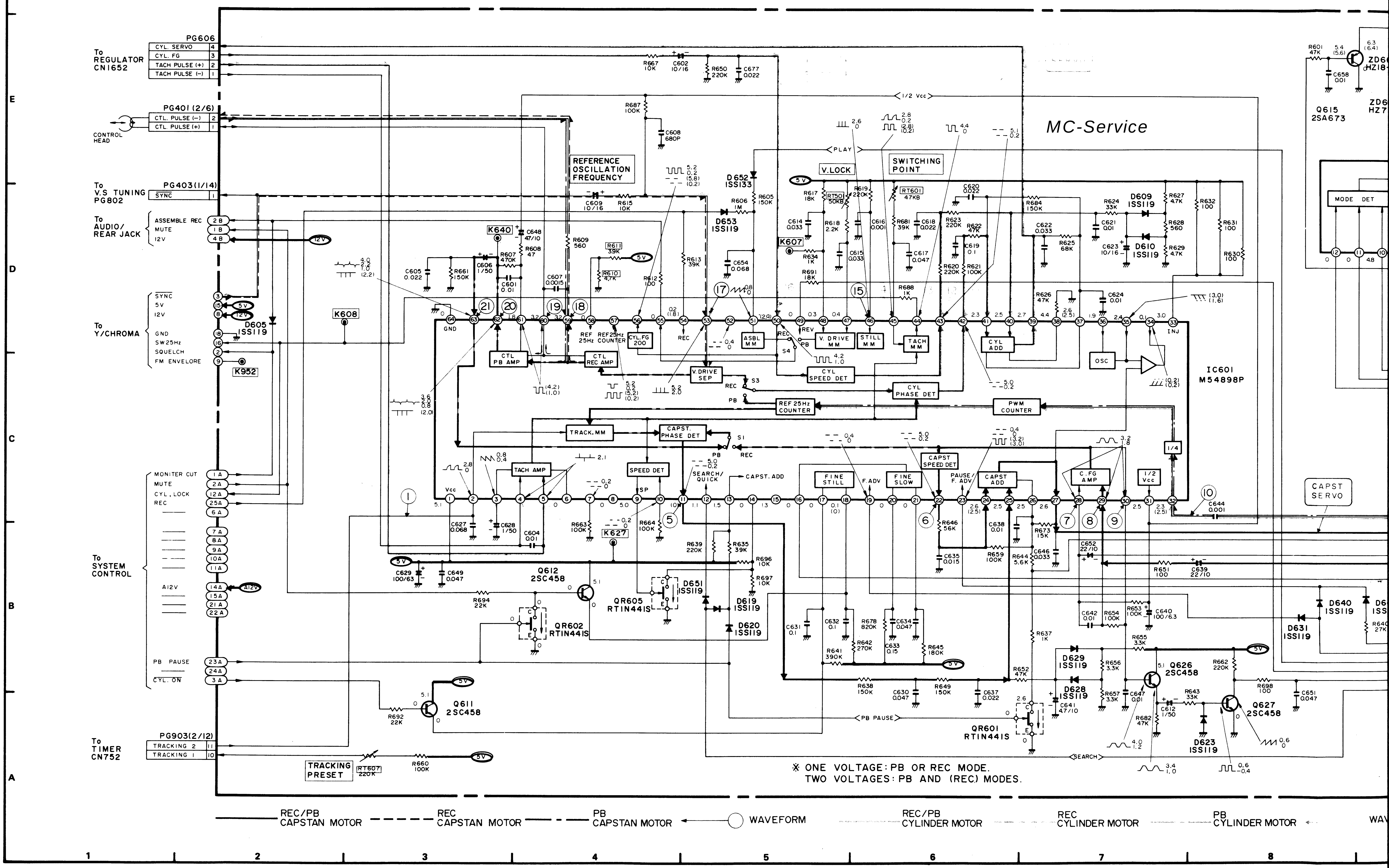
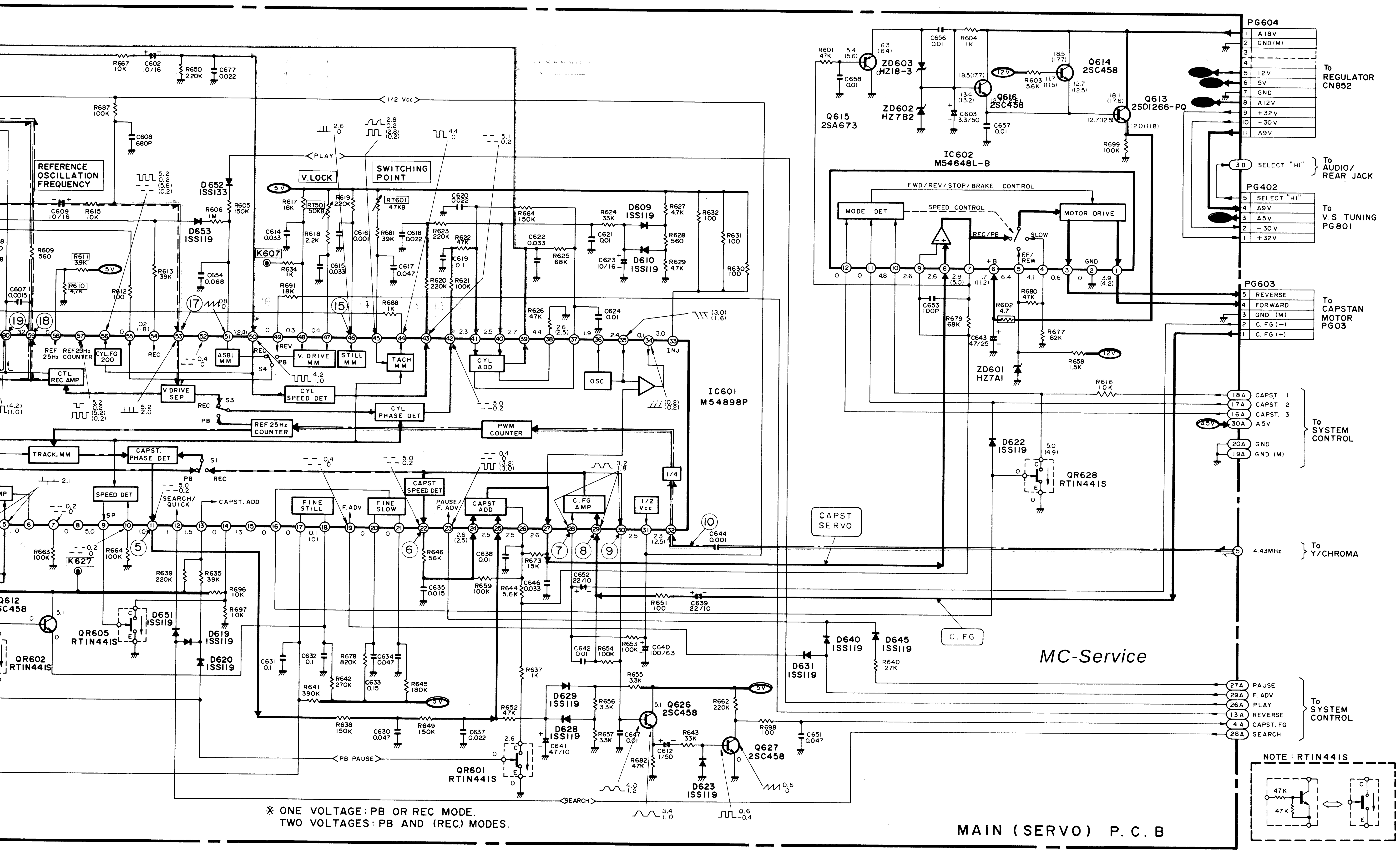
SERVO



PG606
CYL. SERVO
CYL. FG
TACH PULSE (+)
TACH PULSE (−)
To REGULATOR CN1652
PG401 (2/6)
CTL. PULSE (−)
CTL. PULSE (+)
CONTROL HEAD
To V.S TUNING PG802
PG403 (1/14)
SYNC
To AUDIO/ REAR JACK
ASSEMBLE REC
MUTE
12V
To Y/CHROMA
SYNC
5V
12V
GND
SW25Hz
SQUELCH
FM ENVELOPE
K952
K608
D605 1SS119
To SYSTEM CONTROL
MONITER CUT
MUTE
CYL. LOCK
REC
A12V
PB PAUSE
CYL. ON
To TIMER CN752
PG903 (2/12)
TRACKING 2
TRACKING 1
TRACKING PRESET
RT607 220K
R660 100K
Q611 2SC458
R692 22K
Q612 2SC458
R694 22K
QR602 RTIN441S
QR605 RTIN441S
D651 1SS119
D619 1SS119
D620 1SS119
K627
K640
K607
REFERENCE OSCILLATION FREQUENCY
D652 1SS133
D653 1SS119
V.LOCK
SWITCHING POINT
RT501 50KB
RT601 47KB
MC-Service
1/2 Vcc
PLAY
D609 1SS119
D610 1SS119
MODE DET
Q615 2SA673
R601 47K
C658 0.01
CTL PB AMP
CTL REC AMP
CYL.FG 200
V.DRIVE SEP
ASBL MM
V. DRIVE MM
STILL MM
TACH MM
CYL SPEED DET
CYL PHASE DET
REF 25Hz COUNTER
CYL ADD
OSC
PWM COUNTER
IC601 M54898P
TRACK. MM
CAPST. PHASE DET
TACH AMP
SPEED DET
SEARCH/ QUICK
CAPST. ADD
FINE STILL
F. ADV
FINE SLOW
CAPST SPEED DET
PAUSE/ F. ADV
CAPST ADD
C.FG AMP
1/2 Vcc
1/4
CAPST SERVO
INJ
GND
REF 25Hz
REF25Hz COUNTER
REV
REC
PB
S1
S3
S4
QR601 RTIN441S
Q626 2SC458
Q627 2SC458
D623 1SS119
D628 1SS119
D629 1SS119
D631 1SS119
D640 1SS119
PB PAUSE
SEARCH
E
D
C
B
A
1
2
3
4
5
6
7
8
REC/PB CAPSTAN MOTOR
REC CAPSTAN MOTOR
PB CAPSTAN MOTOR
WAVEFORM
REC/PB CYLINDER MOTOR
REC CYLINDER MOTOR
PB CYLINDER MOTOR

※ ONE VOLTAGE: PB OR REC MODE.
TWO VOLTAGES: PB AND (REC) MODES.

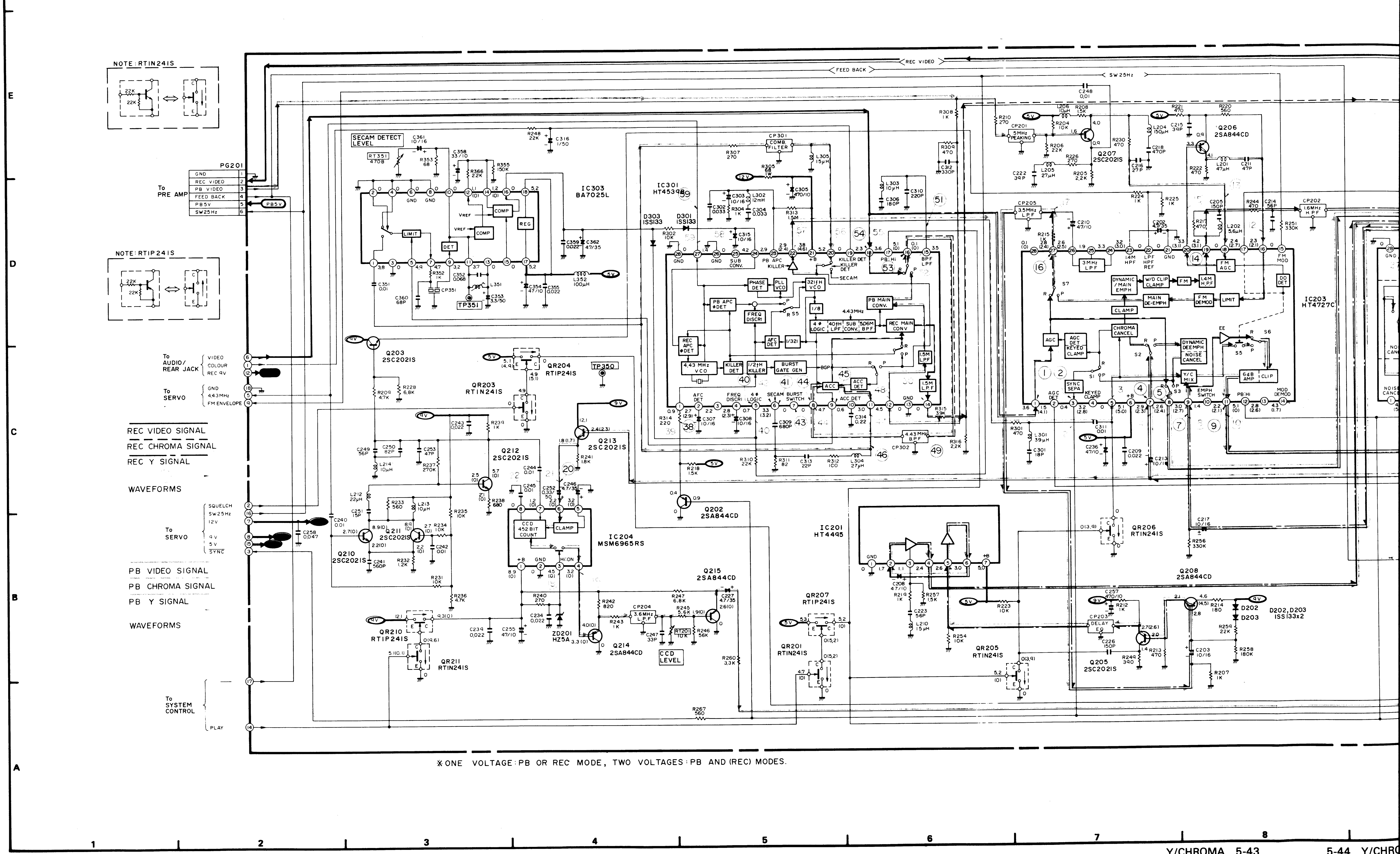

PG604
1 A18V
2 GND(M)
5 12V
6 5V
7 GND
8 A12V
9 +32V
10 −30V
11 A9V
To REGULATOR CN852
Q615 2SA673
ZD603 HZ18-3
ZD602 HZ7B2
Q616 2SC458
Q614 2SC458
Q613 2SD1266-PQ
IC602 M54648L-B
FWD/REV/STOP/BRAKE CONTROL
MODE DET
SPEED CONTROL
MOTOR DRIVE
REC/PB
SLOW
FF/REW
PG402
5 SELECT "Hi"
4 A9V
3 A5V
2 −30V
1 +32V
3B SELECT "Hi"
To AUDIO/ REAR JACK
To V.S TUNING PG801
PG603
5 REVERSE
4 FORWARD
3 GND (M)
2 C.FG(−)
1 C.FG(+)
To CAPSTAN MOTOR PG03
ZD601 HZ7A1
18A CAPST. 1
17A CAPST. 2
16A CAPST. 3
30A A5V
20A GND
19A GND (M)
To SYSTEM CONTROL
D622 1SS119
QR628 RTIN441S
5 4.43MHz
To Y/CHROMA
CAPST SERVO
C.FG
D640 1SS119
D645 1SS119
D631 1SS119
27A PAUSE
29A F.ADV
26A PLAY
13A REVERSE
4A CAPST.FG
28A SEARCH
To SYSTEM CONTROL
NOTE: RTIN441S
REFERENCE OSCILLATION FREQUENCY
V.LOCK
SWITCHING POINT
1/2 Vcc
PLAY
D652 1SS133
D653 1SS119
D609 1SS119
D610 1SS119
K607
IC601 M54898P
REF 25Hz
REF25Hz COUNTER
CYL.FG 200
CTL REC AMP
ASBL MM
V. DRIVE MM
STILL MM
TACH MM
CYL ADD
OSC
INJ
V.DRIVE SEP
CYL SPEED DET
CYL PHASE DET
REF 25Hz COUNTER
PWM COUNTER
TRACK.MM
CAPST. PHASE DET
SPEED DET
SEARCH/ QUICK
CAPST. ADD
FINE STILL
F.ADV
FINE SLOW
CAPST SPEED DET
PAUSE/ F. ADV
CAPST ADD
C.FG AMP
1/2 Vcc
1/4
K627
Q612 2SC458
QR605 RTIN441S
QR602 RTIN441S
D651 1SS119
D619 1SS119
D620 1SS119
D629 1SS119
D628 1SS119
Q626 2SC458
Q627 2SC458
D623 1SS119
QR601 RTIN441S
PB PAUSE
SEARCH
REC
PB
S1
S3
S4
5V
12V
MC-Service
4
5
6
7
8
9
10
11

※ ONE VOLTAGE: PB OR REC MODE.
TWO VOLTAGES: PB AND (REC) MODES.

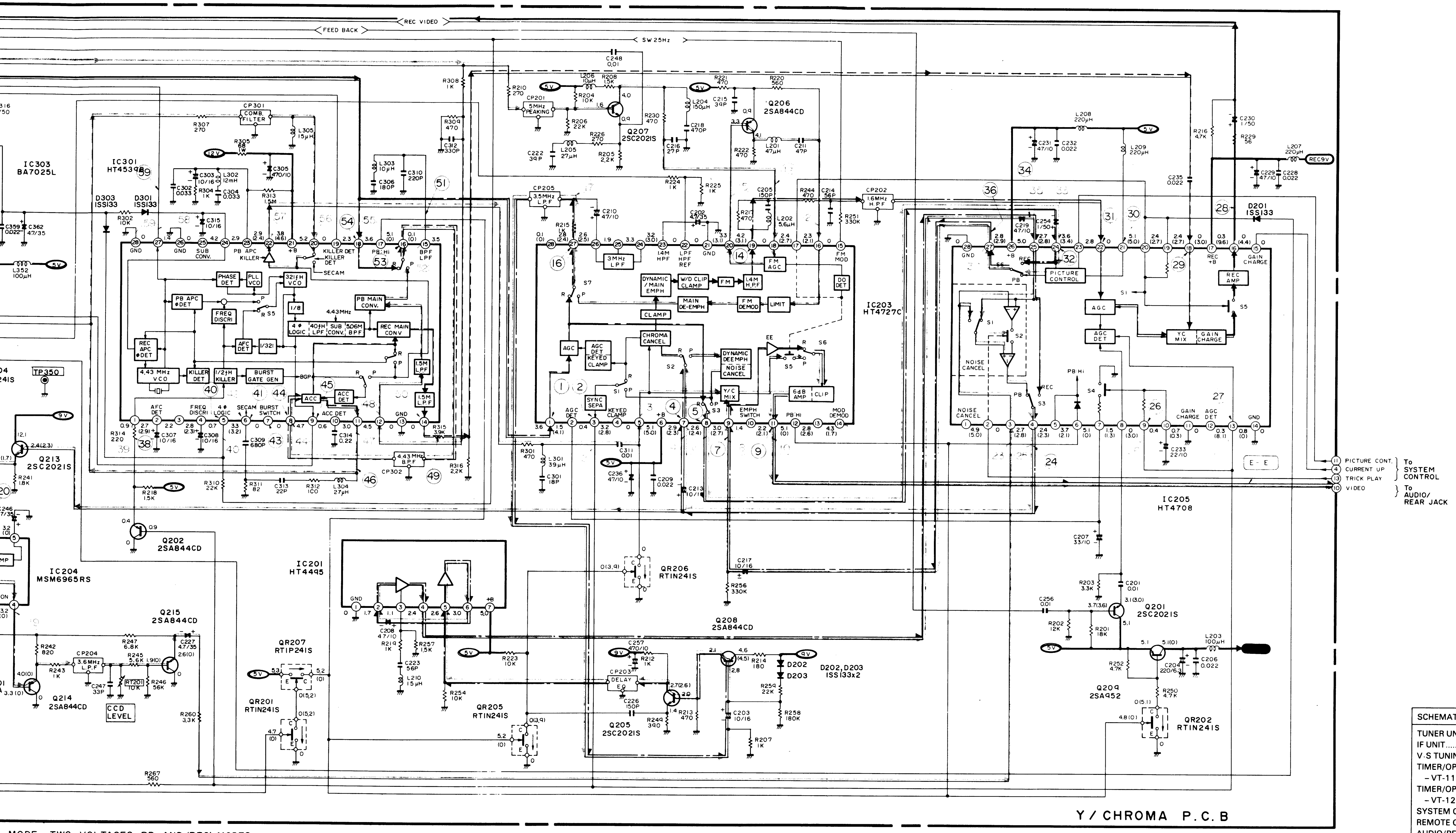
MAIN (SERVO) P. C. B

PB CAPSTAN MOTOR ◯ WAVEFORM REC/PB CYLINDER MOTOR REC CYLINDER MOTOR PB CYLINDER MOTOR WAVEFORM

Y/CHROMA (LUMINANZ/CHROMINANZ)


NOTE: RTIN241S
NOTE: RTIP241S
PG201
To PRE AMP
GND
REC VIDEO
PB VIDEO
FEED BACK
PB5V
SW25Hz
To AUDIO/ REAR JACK
VIDEO
COLOUR
REC 9V
To SERVO
GND
4.43MHz
FM ENVELOPE
REC VIDEO SIGNAL
REC CHROMA SIGNAL
REC Y SIGNAL
WAVEFORMS
SQUELCH
SW25Hz
12V
9V
5V
SYNC
PB VIDEO SIGNAL
PB CHROMA SIGNAL
PB Y SIGNAL
To SYSTEM CONTROL
PLAY
FEED BACK
REC VIDEO
SW25Hz
SECAM DETECT LEVEL
RT351 470B
IC303 BA7025L
LIMIT
DET
COMP
REG
VREF
TP351
L352 100μH
IC301 HT4539B
D303 ISS133
D301 ISS133
CP301 COMB. FILTER
SUB CONV.
PB APC KILLER
KILLER DET
SECAM
PB MAIN CONV.
PHASE DET
PLL VCO
321fH VCO
PB APC φDET
FREQ DISCRI
AFC DET
1/321
1/8
4φ LOGIC
40fH LPF
SUB CONV.
5.06M BPF
4.43MHz
REC MAIN CONV
REC APC φDET
4.43 MHz VCO
KILLER DET
1/2fH KILLER
BURST GATE GEN
ACC
ACC DET
1.5M LPF
AFC DET
FREQ DISCRI
4φ LOGIC
SECAM BURST SWITCH
4.43MHz BPF
CP302
Q203 2SC2021S
QR204 RTIP241S
QR203 RTIN241S
TP350
Q212 2SC2021S
Q213 2SC2021S
IC204 MSM6965RS
CCD 452 BIT COUNT
CLAMP
Q210 2SC2021S
Q211 2SC2021S
QR210 RTIP241S
QR211 RTIN241S
ZD201 HZ5A
Q214 2SA844CD
Q215 2SA844CD
CP204 3.6MHz L.P.F
RT201 10K
CCD LEVEL
Q202 2SA844CD
IC201 HT4495
QR207 RTIP241S
QR201 RTIN241S
QR205 RTIN241S
CP201 5MHz PEAKING
Q207 2SC2021S
Q206 2SA844CD
CP205 3.5MHz L.P.F
CP202 1.6MHz H.P.F
3MHz LPF
14M HPF
LPF HPF REF
FM MOD
FM AGC
1.4M H.P.F
DYNAMIC /MAIN EMPH
W/D CLIP CLAMP
FM
MAIN DE-EMPH
FM DEMOD
LIMIT
DO DET
IC203 HT4727C
CLAMP
AGC
AGC DET KEYED CLAMP
CHROMA CANCEL
DYNAMIC DEEMPH
NOISE CANCEL
SYNC SEPA
KEYED CLAMP
Y/C MIX
EMPH SWITCH
6dB AMP
CLIP
MOD DEMOD
QR206 RTIN241S
Q208 2SA844CD
CP203 DELAY
Q205 2SC2021S
D202 D203
D202,D203 ISS133x2
E
D
C
B
A
1
2
3
4
5
6
7
8

※ONE VOLTAGE: PB OR REC MODE, TWO VOLTAGES: PB AND (REC) MODES.


REC VIDEO
FEED BACK
SW 25Hz
IC303
BA7025L
IC301
HT4539
IC204
MSM6965RS
IC201
HT4495
IC203
HT4727C
IC205
HT4708
Q213
2SC2021S
Q202
2SA844CD
Q215
2SA844CD
Q214
2SA844CD
Q207
2SC2021S
Q206
2SA844CD
Q208
2SA844CD
Q205
2SC2021S
Q201
2SC2021S
Q209
2SA952
QR201
RTIN241S
QR207
RTIP241S
QR205
RTIN241S
QR206
RTIN241S
QR202
RTIN241S
D202, D203
ISS133x2
D201
ISS133
D303
ISS133
D301
ISS133
TP350
CCD
LEVEL
PICTURE CONT.
CURRENT UP
TRICK PLAY
VIDEO
To
SYSTEM
CONTROL
To
AUDIO/
REAR JACK
E - E
Y / CHROMA P. C. B

MODE, TWO VOLTAGES : PB AND (REC) MODES.

SCHEMATIC DIAGRAM	PAGE
TUNER UNIT	5-2
IF UNIT	5-3
V·S TUNING	5-5
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TIMER/OPERATION SWITCH – VT-120E –	5-14
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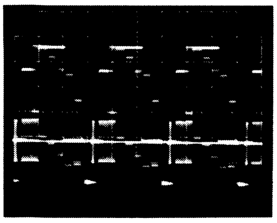
4 5 6 7 8 9 10 11

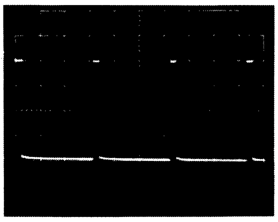
Y/CHROMA CIRCUIT WAVEFORMS (WELLENFORM)

[IC203] **(REC: Colour bar Video in/PB: Alignment tape)**

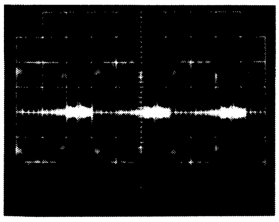
① PIN1 REC
0.1V/20μs. div.



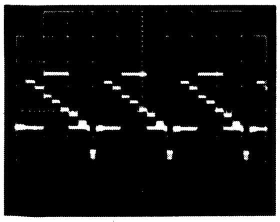
② PIN3 REC/PB
1V/20μs. div.



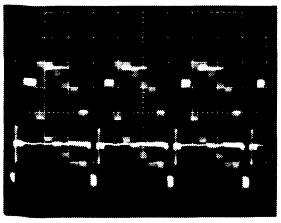
③ PIN5 PB
50mV/20μs. div.



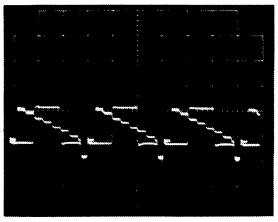
④ PIN7 REC/PB
0.1V/20μs. div.



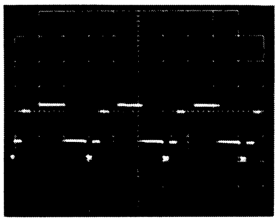
⑤ PIN8 REC
50mV/20μs. div.



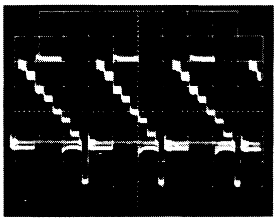
⑥ PIN8 PB
0.5V/20μs. div.



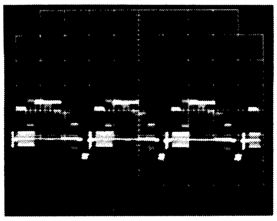
⑦ PIN9 REC
0.1V/20μs. div.



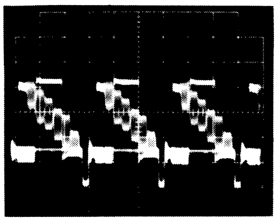
⑧ PIN9 PB
0.2V/20μs. div.



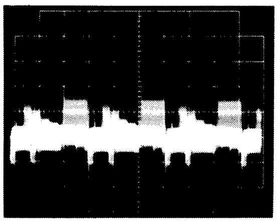
⑨ PIN11 REC
0.1V/20μs. div.



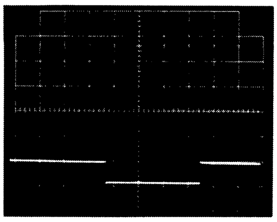
⑩ PIN11 PB
0.5V/20μs. div.



⑪ PIN14 PB
0.2V/20μs. div.

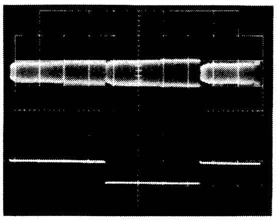


⑫ PIN16 PB
0.5V/5ms. div.



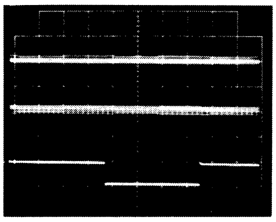
(SW25Hz: 5Vdiv.)

⑬ PIN18 PB
0.5V/5ms. div.



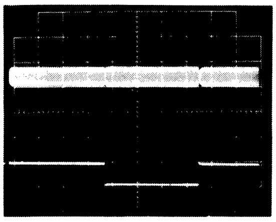
(SW25Hz: 5Vdiv.)

⑭ PIN19 REC
0.5V/5ms. div.



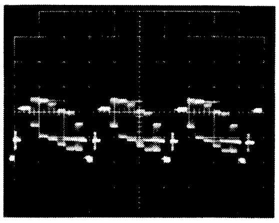
(SW25Hz: 5Vdiv.)

⑮ PIN20 PB
0.5V/5ms. div.

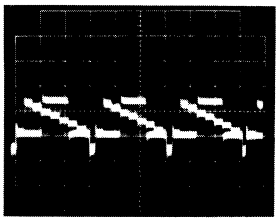


(SW25Hz: 5Vdiv.)

⑯ PIN27 REC
0.1V/20μs. div.

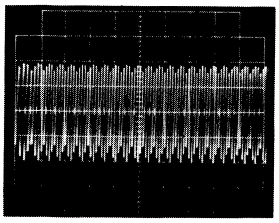


⑰ PIN27 PB
0.1V/20μs. div.

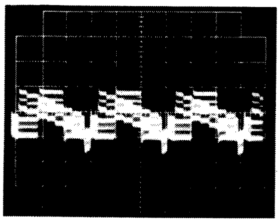


[IC204]

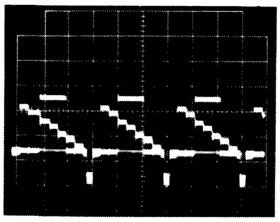
⑱ PIN3 PB
0.2V/0.5μs. div.



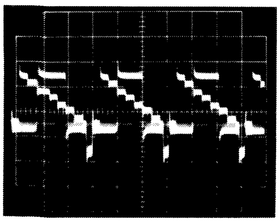
⑲ PIN4 PB
0.5V/20μs. div.



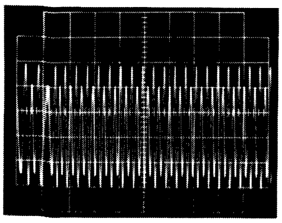
⑳ PIN6 REC
0.1V/20μs. div.



㉑ PIN6 PB
0.1V/20μs. div.

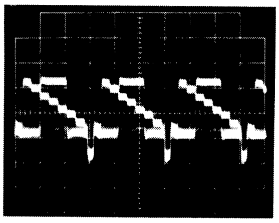


㉒ PIN7 PB
0.1V/0.5μs. div.

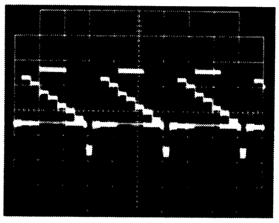


[IC205]

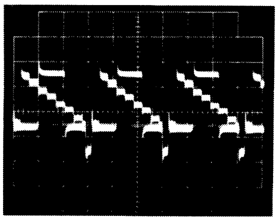
㉓ PIN3 PB
0.1V/20μs. div.



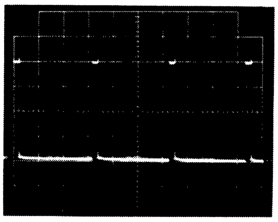
㉔ PIN 4 REC
10mV/20μs. div.



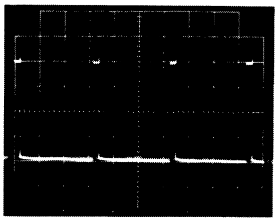
㉕ PIN4 PB
10mV/20μs. div.



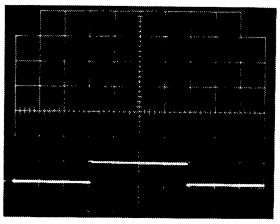
㉖ PIN9 REC/PB
1V/20μs. div.



㉗ PIN13 REC/PB
1V/20μs. div.

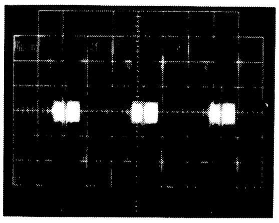


㉘ PIN16 REC
0.5V/5ms. div.

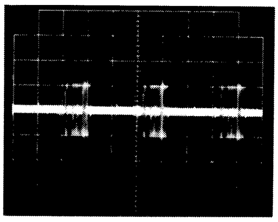


(SW25Hz: 5Vdiv.)

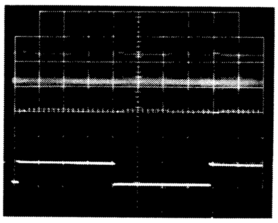
㉙ PIN18 REC
20mV/20μs. div.



㉚ PIN21 REC
50mV/20μs. div.

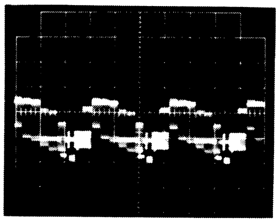


㉛ PIN22 REC
0.2V/5ms. div.

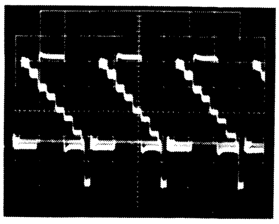


(SW25Hz: 5Vdiv.)

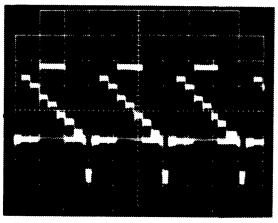
㉜ PIN24 REC
0.1V/20μs. div.



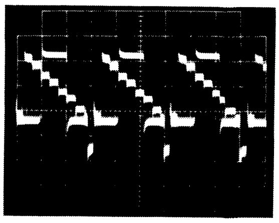
㉝ PIN24 PB
0.2V/20μs. div.



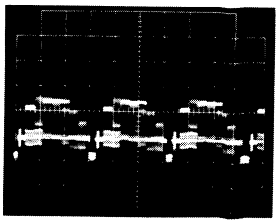
㉞ PIN25 REC
0.1V/20μs. div.



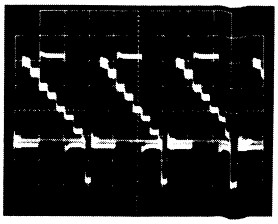
㉟ PIN25 PB
0.1V/20μs. div.



㊱ PIN27 REC
0.1V/20μs. div.

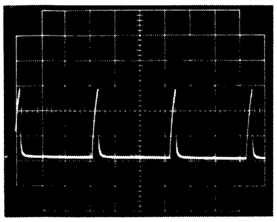


㊲ PIN27 PB
0.2V/20μs. div.

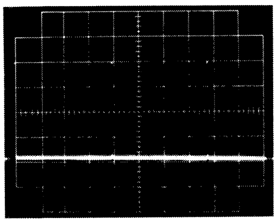


[IC301]

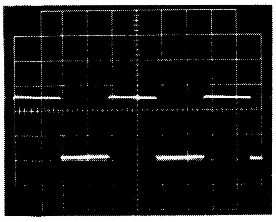
㊳ PIN1 REC
1V/20μs. div.



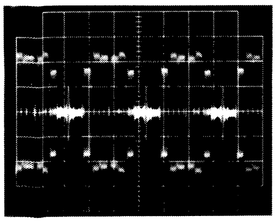
㊴ PIN1 PB
1V/0.5ms. div.



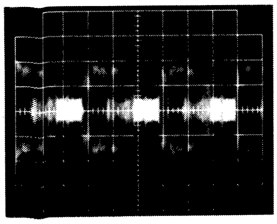
㊵ PIN5 REC/PB
0.5V/10ms. div.



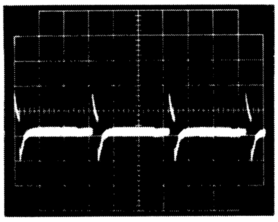
㊶ PIN6 REC
0.1V/20μs. div.



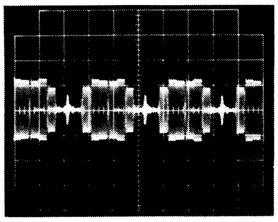
㊷ PIN6 PB
20mV/20μs. div.



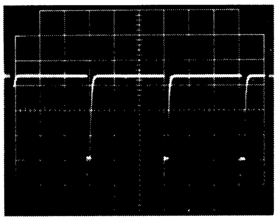
㊸ PIN7 REC/PB
0.1V/20μs. div.



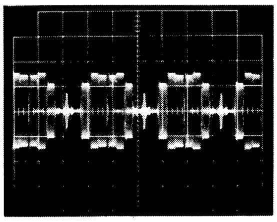
㊹ PIN8 REC/PB
50mV/20μs. div.



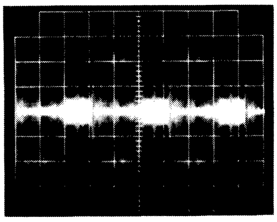
㊺ PIN9 REC/PB
1V/20μs. div.



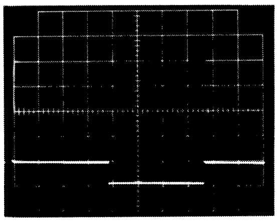
㊻ PIN11 REC
0.2V/20μs. div.



㊼ PIN11 PB
0.2V/20μs. div.

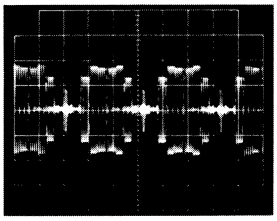


㊽ PIN12 PB
50mV/0.5ms. div.

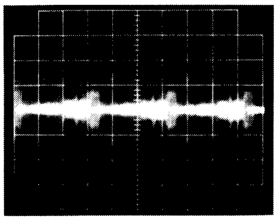


(SW25Hz: 5Vdiv.)

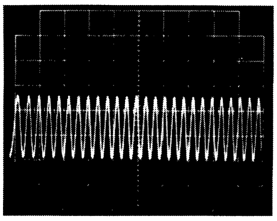
㊾ PIN14 REC
0.1V/20μs. div.



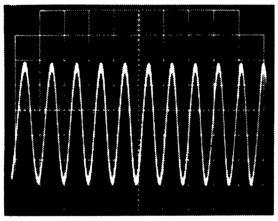
㊿ PIN14 PB
50mV/20μs. div.



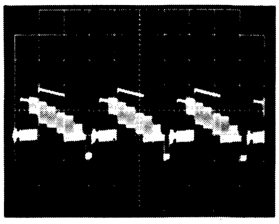
(51) PIN15 REC
0.1V/0.5μs. div.



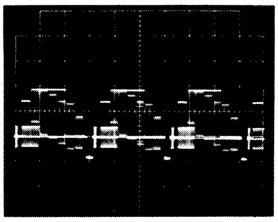
(52) PIN15 PB
50mV/0.2μs. div.



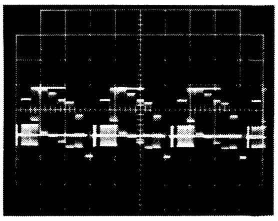
(53) PIN16 REC
0.2V/20μs. div.



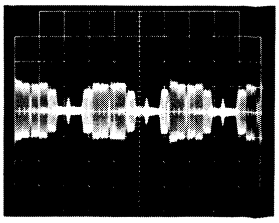
(54) PIN18 REC
0.2V/20μs. div.



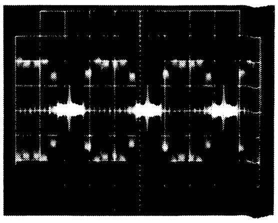
(55) PIN18 PB
0.2V/20μs. div.



(56) PIN20 PB
50mV/20μs. div.

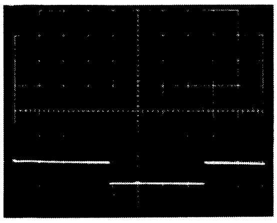


(57) PIN22 PB
0.1V/20μs. div.



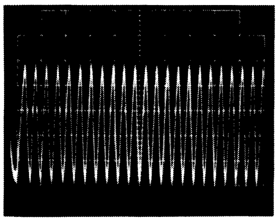
[IC301]

(58) PIN25 PB
0.1V/5ms. div.

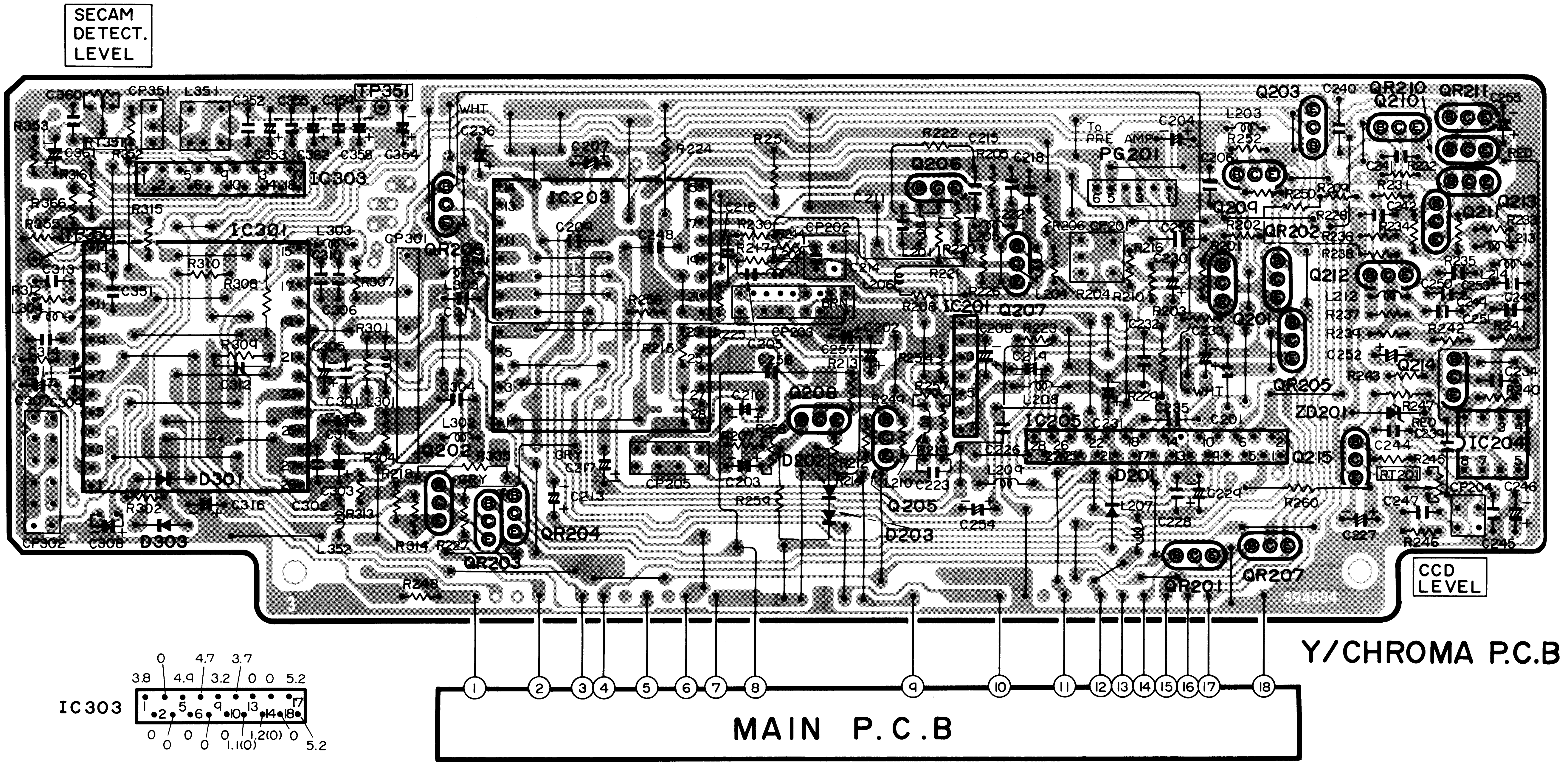


(SW25Hz: 5Vdiv.)

(59) PIN27 REC/PB
50mV/0.5μs. div.



MC-Service


SECAM
DETECT.
LEVEL
CCD
LEVEL
TP351
TP350
IC301
IC303
IC203
IC201
IC205
IC204
D301
D303
D201
D202
D203
ZD201
PG201
To PRE AMP
WHT
GRY
BRN
RED
594884
MAIN P.C.B
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18

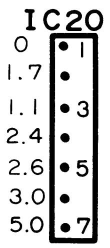
Y/CHROMA P.C.B

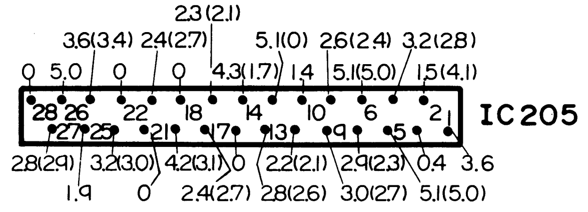
IC303
1 3.8
2 0
0
5 4.9
6 0
4.7
9 3.2
10 0
3.7
13 0
14 1.2(0)
0
17 5.2
18 0
5.2
1.1(0)

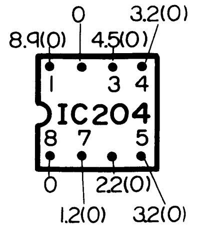
	IC301		
14	0	3.5	15
13	0	0.1 (0)	
	4.5	5.1 (0)	17
11	3.0	3.6	
	0.6	2.3	19
9	4.7	0	
	0	5.2	21
7	0	3.8(4.6)	
	3.3(3.2)	2.9(2.4)	23
5	0.7	2.9	
	2.8(2.3)	4.2	25
3	2.2	0	
	2.7(2.9)	1.4	27
1	0.9	0	28

	IC203		
14	4.3(1.7)	0	15
13	2.8(2.6)	2.3(2.1)	
	5.1(0)	2.4(2.7)	17
11	2.2(2.1)	0	
	1.4	4.2(3.1)	19
9	3.0(2.7)	3.3(3.1)	
	2.6(2.4)	0	21
7	2.9(2.3)	0	
	5.1(5.0)	3.2(3.0)	23
5	0	3.3	
	3.2(2.8)	1.9	25
3	0.4	2.6(2.5)	
	1.5(4.1)	2.8(2.4)	27
1	3.6	0.1(0)	28

MC-Service

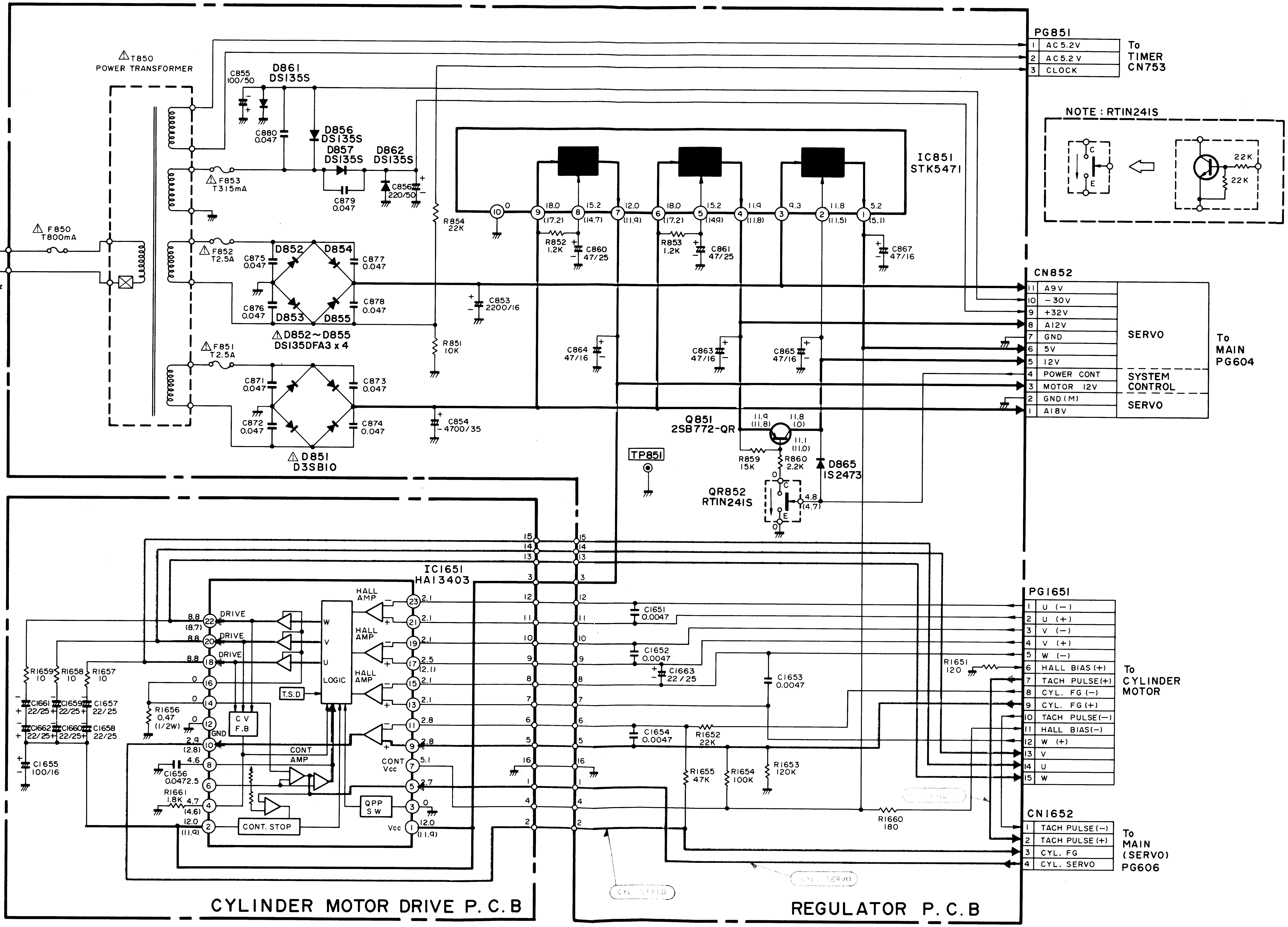

IC201
0
1.7
1.1
2.4
2.6
3.0
5.0
1
3
5
7


IC205
2.3(2.1)
3.6(3.4)
2.4(2.7)
5.1(0)
2.6(2.4)
3.2(2.8)
0
5.0
0
0
4.3(1.7)
1.4
5.1(5.0)
1.5(4.1)
28
26
22
18
14
10
6
2
1
27
25
21
17
13
9
5
2.8(2.9)
3.2(3.0)
4.2(3.1)
0
2.2(2.1)
2.9(2.3)
0.4
3.6
1.9
0
2.4(2.7)
2.8(2.6)
3.0(2.7)
5.1(5.0)

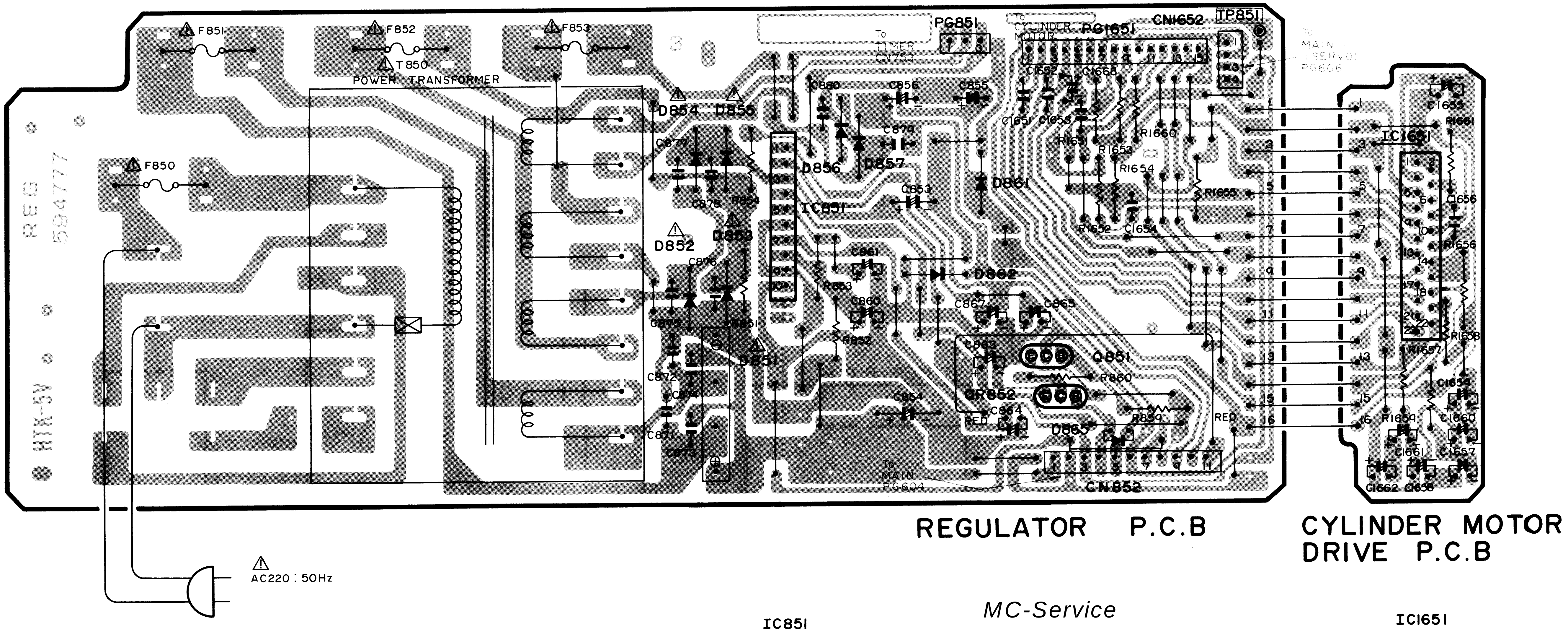

IC204
0
3.2(0)
8.9(0)
4.5(0)
1
3
4
8
7
5
0
2.2(0)
1.2(0)
3.2(0)

※ONE VOLTAGE : PB OR REC MODE,
TWO VOLTAGES : PB AND (REC) MODES.

REGULATOR (REGLER)


T850 POWER TRANSFORMER
F850 T800mA
AC220/50Hz
F853 T315mA
F852 T2.5A
F851 T2.5A
C855 100/50
D861 DS135S
C880 0.047
D856 DS135S
D857 DS135S
D862 DS135S
C879 0.047
C856 220/50
D852 D854 D853 D855
D852~D855 DS135DFA3 x 4
C875 0.047
C876 0.047
C877 0.047
C878 0.047
C871 0.047
C872 0.047
C873 0.047
C874 0.047
D851 D3SB10
R854 22K
R851 10K
C853 2200/16
C854 4700/35
IC851 STK5471
R852 1.2K
C860 47/25
R853 1.2K
C861 47/25
C867 47/16
C864 47/16
C863 47/16
C865 47/16
Q851 2SB772-QR
R859 15K
R860 2.2K
D865 IS2473
QR852 RTIN241S
TP851
PG851
1 AC5.2V
2 AC5.2V
3 CLOCK
To TIMER CN753
NOTE : RTIN241S
22K
22K
CN852
11 A9V
10 -30V
9 +32V
8 A12V
7 GND
6 5V
5 12V
4 POWER CONT
3 MOTOR 12V
2 GND (M)
1 A18V
SERVO
SYSTEM CONTROL
SERVO
To MAIN PG604
IC1651 HA13403
HALL AMP
DRIVE
W V U
LOGIC
T.S.D
C V F.B
CONT AMP
CONT STOP
QPP SW
CONT Vcc
Vcc
GND
R1659 10
R1658 10
R1657 10
C1661 22/25
C1659 22/25
C1657 22/25
C1662 22/25
C1660 22/25
C1658 22/25
C1655 100/16
R1656 0.47 (1/2W)
C1656 0.047
R1661 1.8K
C1651 0.0047
C1652 0.0047
C1663 22/25
C1653 0.0047
C1654 0.0047
R1652 22K
R1655 47K
R1654 100K
R1653 120K
R1651 120
R1660 180
PG1651
1 U (-)
2 U (+)
3 V (-)
4 V (+)
5 W (-)
6 HALL BIAS (+)
7 TACH PULSE(+)
8 CYL. FG (-)
9 CYL. FG (+)
10 TACH PULSE(-)
11 HALL BIAS(-)
12 W (+)
13 V
14 U
15 W
To CYLINDER MOTOR
CN1652
1 TACH PULSE(-)
2 TACH PULSE(+)
3 CYL. FG
4 CYL. SERVO
To MAIN (SERVO) PG606
CYLINDER MOTOR DRIVE P.C.B
REGULATOR P.C.B

※ ONE VOLTAGE: PB OR REC MODE. TWO VOLTAGES: PB AND (REC) MODE.


F851
F852
F853
T850
POWER TRANSFORMER
F850
REG
594777
HTK-5V
D854
D855
C877
C878
R854
D852
D853
C876
C875
R851
D851
C872
C874
C871
C873
IC851
D856
D857
C880
C856
C855
C879
C853
D861
C861
R853
C860
R852
D862
C867
C865
C863
Q851
R860
QR852
C864
RED
D865
R859
CN852
To MAIN PG604
To TIMER CN753
PG851
To CYLINDER MOTOR
PG1651
CN1652
TP851
To MAIN (SERVO) PG606
C1652
C1663
C1651
C1653
R1651
R1653
R1660
R1654
R1655
R1652
C1654
IC1651
C1655
R1661
C1656
R1656
R1658
R1657
C1659
C1660
R1659
C1661
C1657
C1662
C1658
AC220 : 50Hz

REGULATOR P.C.B

CYLINDER MOTOR DRIVE P.C.B

IC851

Pin	Voltage
1	5.2 (5.1)
	11.8 (11.5)
3	9.3
	11.9 (11.8)
5	15.2 (14.9)
	18.0 (17.2)
7	12.0 (11.9)
	15.2 (14.7)
9	18.0 (17.2)
10	0

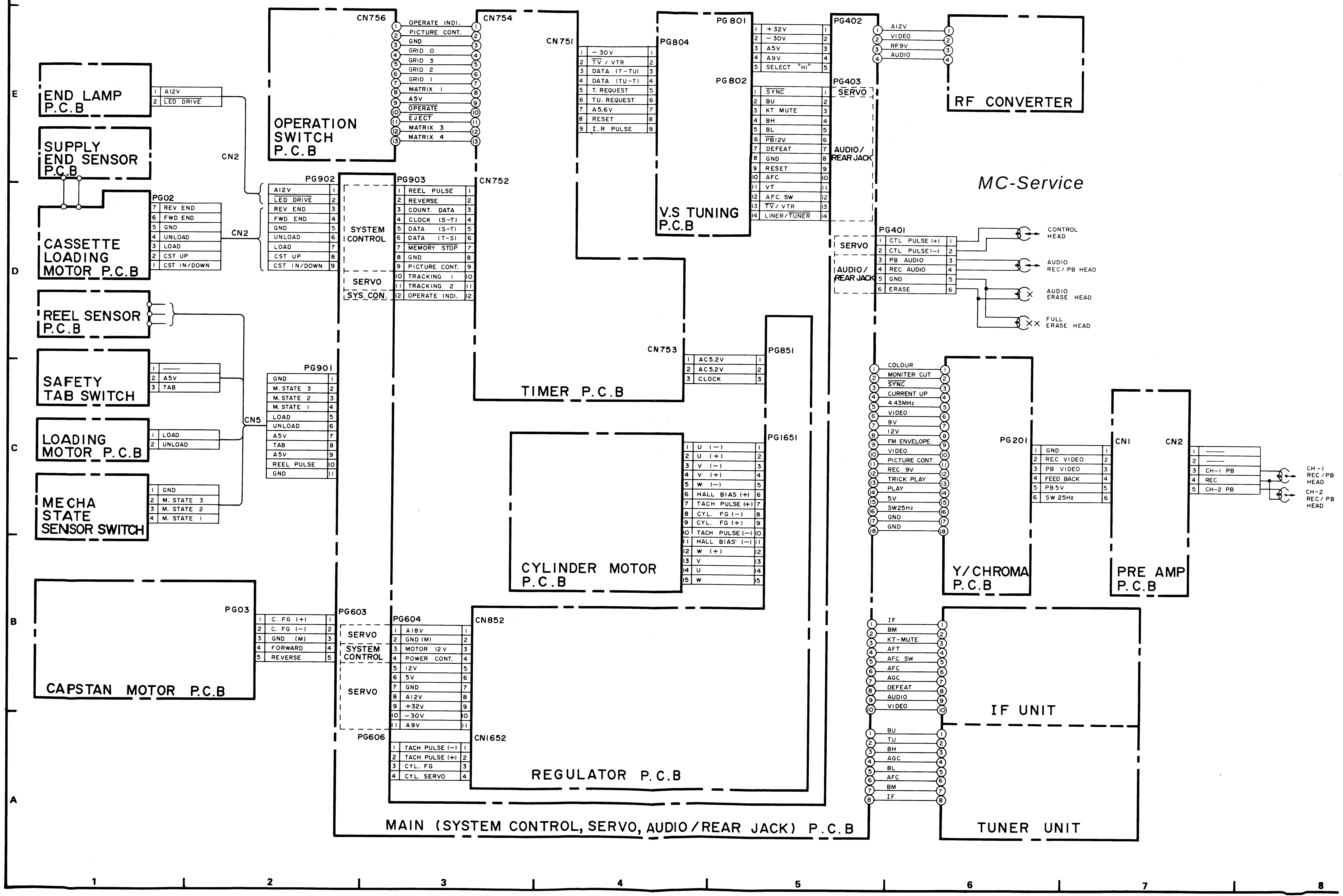
※ ONE VOLTAGE : PB OR REC MODE.
TWO VOLTAGES : PB AND (REC) MODE.

IC1651

Voltage	Pin	Pin	Voltage
12.0 (11.9)	1	2	12.0 (11.9)
0			4.7 (4.6)
2.7	5	6	2.5
5.1			4.6
2.8	9	10	2.9 (2.8)
2.8			0
2.1	13	14	0
2.1			0
2.5 (2.1)	17	18	8.8
2.1			8.8
2.1	21		8.8 (8.7)
2.1	23	22	

SCHEMATIC DIAGRAM	PAGE
TUNER UNIT	5-2
IF UNIT	5-3
V.S TUNING	5-5
TIMER/OPERATION SWITCH -VT-110E-	5-11
TIMER/OPERATION SWITCH -VT-120E-	5-14
SYSTEM CONTROL	5-20
REMOTE CONTROL	5-24
AUDIO/REAR JACK	5-26
RF CONVERTER	5-29
PREAMP	5-30
SERVO	5-39
Y/CHROMA	5-42
REGULATOR	5-51
INTERNAL WIRING DIAGRAM	5-55

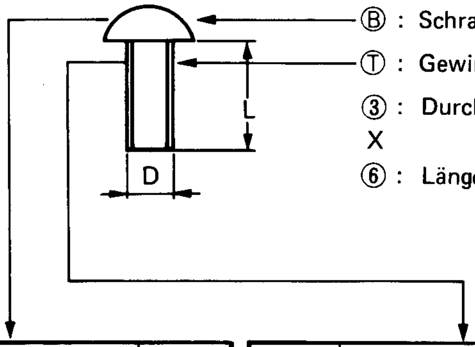
INTERNAL WIRING DIAGRAM (KABELANSCHLUSSDIAGRAMM)


E
D
C
B
A
1
2
3
4
5
6
7
8
END LAMP P.C.B
1 A12V
2 LED DRIVE
SUPPLY END SENSOR P.C.B
CN2
CASSETTE LOADING MOTOR P.C.B
PG02
7 REV END
6 FWD END
5 GND
4 UNLOAD
3 LOAD
2 CST UP
1 CST IN/DOWN
CN2
REEL SENSOR P.C.B
SAFETY TAB SWITCH
1 —
2 A5V
3 TAB
LOADING MOTOR P.C.B
1 LOAD
2 UNLOAD
MECHA STATE SENSOR SWITCH
1 GND
2 M. STATE 3
3 M. STATE 2
4 M. STATE 1
CN5
CAPSTAN MOTOR P.C.B
PG03
1 C. FG (+)
2 C. FG (−)
3 GND (M)
4 FORWARD
5 REVERSE
OPERATION SWITCH P.C.B
CN756
1 OPERATE INDI.
2 PICTURE CONT.
3 GND
4 GRID 0
5 GRID 3
6 GRID 2
7 GRID 1
8 MATRIX 1
9 A5V
10 OPERATE
11 EJECT
12 MATRIX 3
13 MATRIX 4
CN754
PG902
1 A12V
2 LED DRIVE
3 REV END
4 FWD END
5 GND
6 UNLOAD
7 LOAD
8 CST UP
9 CST IN/DOWN
SYSTEM CONTROL
SERVO
SYS. CON.
PG903
1 REEL PULSE
2 REVERSE
3 COUNT. DATA
4 CLOCK (S-T)
5 DATA (S-T)
6 DATA (T-S)
7 MEMORY STOP
8 GND
9 PICTURE CONT.
10 TRACKING 1
11 TRACKING 2
12 OPERATE INDI.
CN752
PG901
1 GND
2 M. STATE 3
3 M. STATE 2
4 M. STATE 1
5 LOAD
6 UNLOAD
7 A5V
8 TAB
9 A5V
10 REEL PULSE
11 GND
CN751
1 −30V
2 TV / VTR
3 DATA (T-TU)
4 DATA (TU-T)
5 T. REQUEST
6 TU. REQUEST
7 A5.6V
8 RESET
9 I.R PULSE
PG804
PG801
1 +32V
2 −30V
3 A5V
4 A9V
5 SELECT "HI"
PG802
1 SYNC
2 BU
3 KT MUTE
4 BH
5 BL
6 PB12V
7 DEFEAT
8 GND
9 RESET
10 AFC
11 VT
12 AFC SW
13 TV / VTR
14 LINER/TUNER
V.S TUNING P.C.B
PG402
1 A12V
2 VIDEO
3 RF9V
4 AUDIO
RF CONVERTER
PG403
SERVO
AUDIO / REAR JACK
PG401
SERVO
AUDIO / REAR JACK
1 CTL PULSE (+)
2 CTL PULSE (−)
3 PB AUDIO
4 REC AUDIO
5 GND
6 ERASE
CONTROL HEAD
AUDIO REC/PB HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
CN753
1 AC5.2V
2 AC5.2V
3 CLOCK
PG851
TIMER P.C.B
CYLINDER MOTOR P.C.B
PG1651
1 U (−)
2 U (+)
3 V (−)
4 V (+)
5 W (−)
6 HALL BIAS (+)
7 TACH PULSE (+)
8 CYL. FG (−)
9 CYL. FG (+)
10 TACH PULSE (−)
11 HALL BIAS' (−)
12 W (+)
13 V
14 U
15 W
1 COLOUR
2 MONITER CUT
3 SYNC
4 CURRENT UP
5 4.43MHz
6 VIDEO
7 9V
8 12V
9 FM ENVELOPE
10 VIDEO
11 PICTURE CONT.
12 REC 9V
13 TRICK PLAY
14 PLAY
15 5V
16 SW25Hz
17 GND
18 GND
Y/CHROMA P.C.B
PG201
1 GND
2 REC VIDEO
3 PB VIDEO
4 FEED BACK
5 PB5V
6 SW 25Hz
CN1
CN2
PRE AMP P.C.B
1 —
2 —
3 CH-1 PB
4 REC
5 CH-2 PB
CH-1 REC/PB HEAD
CH-2 REC/PB HEAD
PG603
SERVO
SYSTEM CONTROL
SERVO
PG604
1 A18V
2 GND (M)
3 MOTOR 12V
4 POWER CONT.
5 12V
6 5V
7 GND
8 A12V
9 +32V
10 −30V
11 A9V
CN852
PG606
1 TACH PULSE (−)
2 TACH PULSE (+)
3 CYL. FG
4 CYL. SERVO
CN1652
REGULATOR P.C.B
1 IF
2 BM
3 KT-MUTE
4 AFT
5 AFC SW
6 AFC
7 AGC
8 DEFEAT
9 AUDIO
10 VIDEO
IF UNIT
1 BU
2 TU
3 BH
4 AGC
5 BL
6 AFC
7 BM
8 IF
TUNER UNIT
MAIN (SYSTEM CONTROL, SERVO, AUDIO/REAR JACK) P.C.B

EXPLOSIONSZEICHNUNGEN

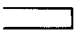
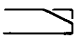
Schrauben-Klassifikation

Beispiel: BT3 x 6

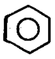


Ⓑ : Schraubenkopfart
Ⓣ : Gewindetyp
③ : Durchmesser (D)
X
⑥ : Länge (L)

Abkürzung	Bezeichnung	Form
Kein symbol	Rundkopfschraube	
P	Zylinderkopfschraube	
B	Halbrundschraube	
O	Linsenkopf-Senkschraube	
F	Senkschraube	

Abkürzung	Bezeichnung	Form
Kein symbol	Maschinenschraube	
t	Schneidschraube Typ 1 (selbstschneidend)	
T	Schneidschraube Typ 2 (selbstschneidend)	
f	Blechschraube (für Metall)	
Hinweis: Blechschrauben sind selbstschneidend; die selbstschneidenden maschinenschrauben können durch Schneidschrauben ersetzt werden.		

Unterlegescheiben und Muttern

Abkürzung	Bezeichnung	Form
W SW LW	Unterlegescheibe Federscheibe Sicherungsscheibe	
E	E-Ring	
N	Mutter	
Hinweis: Für Muttern und Scheiben werden der Innendurchmesser angegeben.		

Schmierung

Die Schmierpunkte sind in den Explosionszeichnungen durch Symbole (Ⓢ, Ⓗ) gekennzeichnet.
Die im Diagramm gezeigten Schmierpunkte sind mit folgenden Schmiermittel zu schmieren:

Ⓢ Sonic-Gleitöl (Nr. 1600)
Ⓗ Hitazol (MO-138)

MECHANICAL PARTS LIST (CABINET ASSEMBLY SECTION)

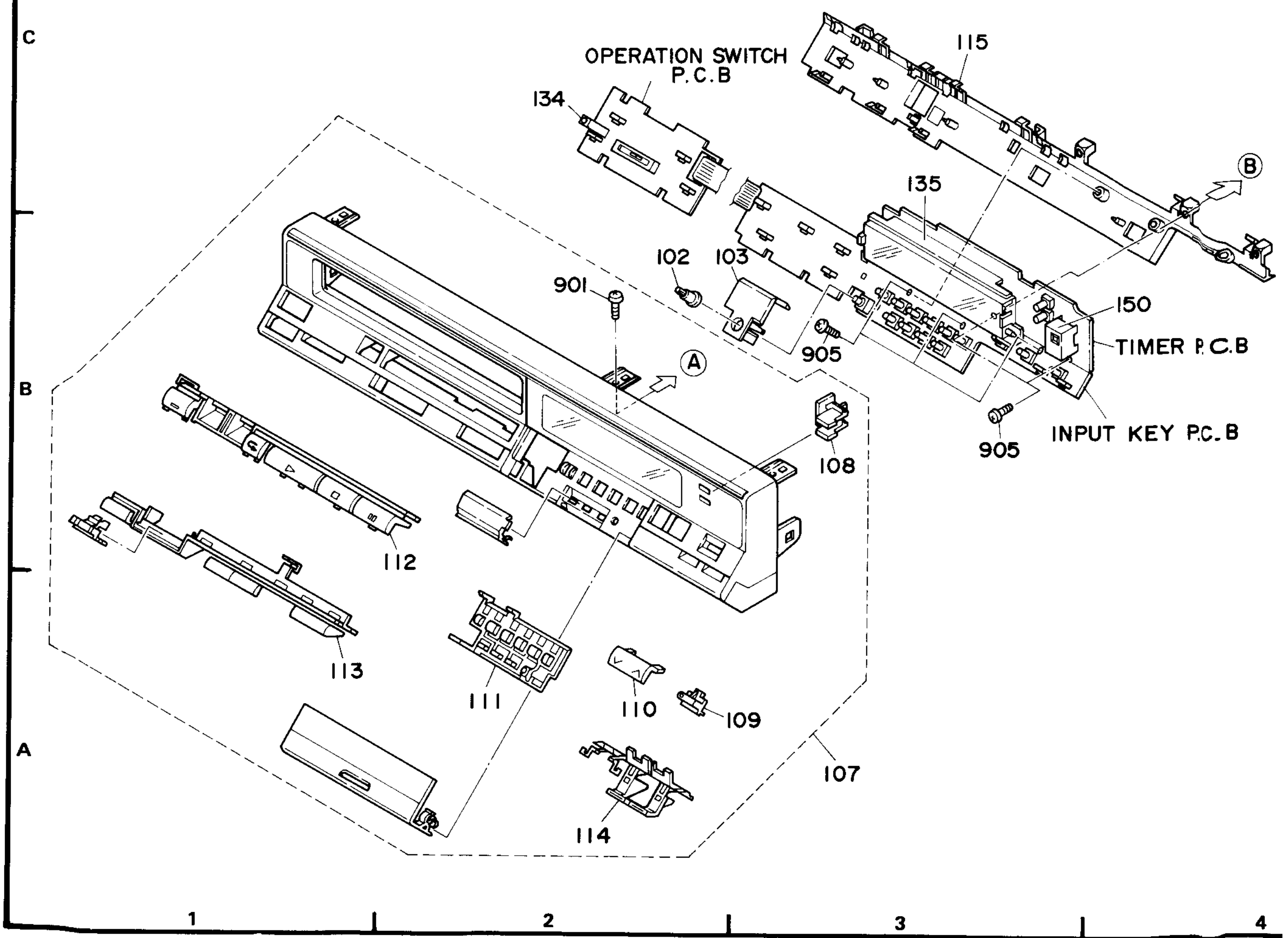
SYMBOL-NO.	P-NO.	DESCRIPTION
FOR FINAL ASSEMBLY		
101	6189398	DOOR-CASSETTE
102	6076843	KNOB - VT-110E -
102	6077031	ROTARY KNOB - VT-120E -
103	6175503	PRESET COVER - VT-110E -
103	6892333	HOLDER - VT-120E -
104	7741444	FELT (LEG)
105	6001561	BOTTOM COVER
106	6001894	TOP COVER ASSEMBLY
107	6238441	FRONT PANEL ASSEMBLY - VT-110E -
107	6238491	FRONT PANEL ASSEMBLY - VT-120E -
108	6083802	BUTTON - VT-110E -
108	6083613	BUTTON - VT-120E -
109	6083762	BUTTON - VT-110E -
109	6083572	BUTTON - VT-120E -
110	6083752	BUTTON (CHANNEL) - VT-110E -
110	6083582	BUTTON - VT-120E -
111	6083812	BUTTON - VT-110E -
111	6083603	BUTTON - VT-120E -
112	6083783	BUTTON (PLAY) - VT-110E -
112	6083892	BUTTON - VT-120E -
113	6084921	BUTTON - VT-110E -
114	6083795	BUTTON - VT-110E -
114	6083593	BUTTON - VT-120E -
115	6083832	BUTTON (POWER) - VT-110E -
115	6890461	PCB HOLDER - VT-120E -
116	6864241	CAP
117	6592111	RUBBER CAP
118	6083784	BUTTON (STOP)
119	6753911	FUSE COVER
120	6026751	REAR PANEL
123	6795152	RIVET
124	6890562	HINGE
125	6890501	STUD

MECHANICAL PARTS LIST (CABINET ASSEMBLY SECTION)

	SYMBOL-NO.	P-NO.	DESCRIPTION
	126	6794591	BUSHING
⚠	127	5746157	POWER CORD WITH PLUG
⚠	128	5213811	POWER TRANSFORMER
	130	6890442	REAR PIECE – VT-110E –
	130	6892513	REAR PIECE – VT-120E –
	131	5658191	JACK PLATE – VT-110E –
	131	5672971	JACK PLATE – VT-120E –
	132	5586591	TUNER IF BLOCK
	133	5587621	RF CONVERTOR
	134	6875562	LED HOLDER – VT-120E –
	134	6890631	LED HOLDER – VT-120E –
	135	6891531	DISPLAY HOLDER
	150	5490295	IR MODULE
	901	8699410	BT SCREW 3MMD × 10MM BLACK
	902	7784428	SCREW (M3)
	903	8741406	BIND SCREW – 3MMD × 6MM
	904	8691408	BT SCREW 3MMD × 8MM
	905	8699410	BT SCREW 3MMD × 10MM BLACK
	906	8699412	BT SCREW 3MMD × 12MM BLACK
	907	8691608	SCREW 4 × 8BT

SYMBOL-NO.	P-NO.	DESCRIPTION
908	8691414	BT SCREW 3MMD × 14MM
909	8691408	BIND HEAD TAPPING SCREW 3MMD × 8MM
		FOR ACCESSORIES
801	4650102	OPERATING GUIDE – VT-110E –
801	4650272	OPERATING GUIDE – VT-120E –
802	5898876	CONNECTOR CORD
803	5638871	REMOTE HAND SET – VT-110E –
803	5638902	REMOTE CONTROL BOX – VT-120E –
		FOR CHASSIS ASSEMBLY
001	5959561	REGULATOR PCB ASSEMBLY
002	5959551	TIMER PCB ASSEMBLY – VT-110E –
003	5959471	OPERATION SWITCH PCB ASSEMBLY – VT-110E –
004	5927931	MAIN PCB ASSEMBLY
005	7094711	END LED PCB
006	7095031	REEL SENSOR PCB

CABINET SECTION (GEHÄUSEEINHEIT) – VT-120E –



SYMBOL-NO.	P-NO.	DESCRIPTION
Q808	5321214	TRANSISTOR 2SD468BC SILICON 190MHZ 0.9W
Q810	5327031	TRANSISTOR 2SA673C
Q811	5327031	TRANSISTOR 2SA673C
Q814	5323902	TRANSISTOR 2SC1740-S
Q851	5323334	TRANSISTOR 2SB772-QR
Q904	5327001	TRANSISTOR 2SC458CD
QR201	5327081	TRANSISTOR RT1N241S
QR203	5327081	TRANSISTOR RT1N241S
QR204	5327083	TRANSISTOR RT1P241S
QR205	5327081	TRANSISTOR RT1N241S
QR206	5327083	TRANSISTOR RT1P241S
QR210	5327083	TRANSISTOR RT1P241S
QR211	5327081	TRANSISTOR RT1N241S
QR432	5327082	TRANSISTOR RT1N241S
QR501	5324094	TRANSISTOR RT1P441S
QR502	5324092	TRANSISTOR RT1N441S
QR505	5324092	TRANSISTOR RT1N441S
QR506	5324092	TRANSISTOR RT1N441S
QR601	5327082	TRANSISTOR RT1N441S
QR602	5327082	TRANSISTOR RT1N441S
QR605	5327082	TRANSISTOR RT1N441S
QR628	5327082	TRANSISTOR RT1N441S
QR758	5324092	TRANSISTOR RT1N441S
QR801	5327082	TRANSISTOR RT1N441S
QR804	5327082	TRANSISTOR RT1N441S
QR812	5327082	TRANSISTOR RT1N441S
QR852	5327081	TRANSISTOR RT1N241S
ZD201	5331014	DIODE HZ5A SI ZENER
ZD601	5339105	DIODE HZ7A1
ZD602	5339101	DIODE HZ7B2
ZD603	5331271	DIODE HZ18-3
ZD751	5332633	ZENER DIODE RD4R7J B1-2
ZD752	5330322	DIODE HZ9B SI ZENER 1MHZ 0.4W
ZD753	5331588	DIODE RD2. 7E-B2
ZD801	5366151	IC UPC574J
ZD802	5339102	DIODE HZ5A
ZD803	5331274	DIODE ZENER HZ30-1

TRANSFORMERS

SYMBOL-NO.	P-NO.	DESCRIPTION
T401	5262531	BIAS COIL

COILS

SYMBOL-NO.	P-NO.	DESCRIPTION
L201	5159145	CHOKE COIL 22μH
L202	5159143	CHOKE COIL 15μH
L204	5159158	CHOKE COIL 220μH
L205	5159143	CHOKE COIL 15μH
L207	5159082	CHOKE COIL 220μH ±10%
L208	5159082	CHOKE COIL 220μH ±10%
L209	5159158	CHOKE COIL 220μH
L210	5159151	CHOKE COIL 56μH
L212	5159145	CHOKE COIL 22μH
L213	5159141	CHOKE COIL 10μH
L214	5159141	CHOKE COIL 10μH
L301	5159148	CHOKE COIL 39μH
L302	5150577	CHOKE COIL 12mH
L303	5153031	CHOKE COIL 10μH
L304	5159146	CHOKE COIL 27μH

SYMBOL-NO.	P-NO.	DESCRIPTION
L305	5159143	CHOKE COIL 15μH
L351	5120849	TRAP COIL
L352	5159077	CHOKE COIL 100μH ±10%
L401	5152349	CHOKE COIL 820μH
L403	5159111	CHOKE COIL 5600μH
L404	5152346	CHOKE COIL 5.6mH
L501	5159158	CHOKE COIL 220μH
L502	5159154	CHOKE COIL 100μH
L503	5159154	CHOKE COIL 100μH
L901	5159077	CHOKE COIL 100μH ±10%

CRYSTALS

SYMBOL-NO.	P-NO.	DESCRIPTION
X751	5781611	CRYSTAL
X801	5781121	XTAL

MISCELLANEOUS

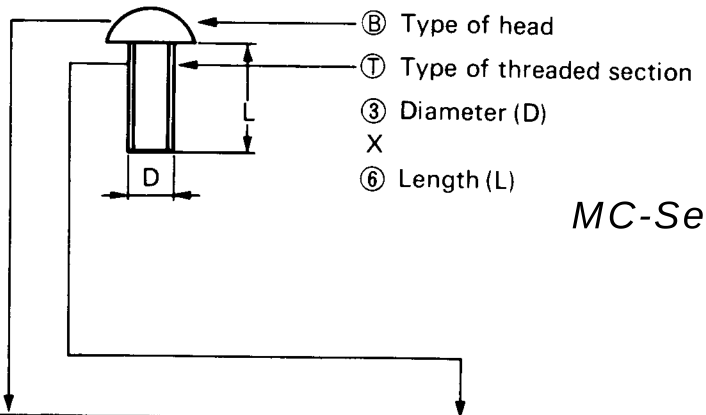
SYMBOL-NO.	P-NO.	DESCRIPTION
BZ799	5409271	BUZZER – VT120E –
CE901	5781121	XTAL
CP201	5123839	TRAP COIL
CP202	5169002	HIGH PASS FILTER
CP203	5169012	DELAY LINE
CP204	5169003	LOW PASS FILTER
CP205	5169022	LOW PASS FILTER
CP301	5785814	DELAY LINE
CP302	5163081	BAND PASS FILTER
CP351	5160431	BAND PASS FILTER
DG751	5311772	TIMER DISPLAY
⚠ F850	5720175	FUSE 0.8A
⚠ F851	5721064	FUSE 2.5A
⚠ F852	5721064	FUSE 2.5A
⚠ F853	5720171	FUSE 315MA
PD751	5490295	IR MODULE
S143	5633362	PUSH SWITCH
S144	5633362	PUSH SWITCH
S501	5622462	SLIDE SWITCH
S751	5635061	SWITCH
S752	5635061	SWITCH
S753	5635061	SWITCH
S754	5635061	SWITCH
S755	5635061	SWITCH
S756	5635061	SWITCH
S759	5635061	SWITCH
S760	5635061	SWITCH
S761	5635061	SWITCH
S762	5635061	SWITCH
S764	5635061	SWITCH
S765	5635061	SWITCH
S766	5635061	SWITCH
S768	5635061	SWITCH
S769	5635061	SWITCH
S771	5635061	SWITCH – VT-110E –
S772	5635061	SWITCH – VT-110E –
S773	5635061	SWITCH – VT-110E –
S775	5635061	SWITCH – VT-110E –
S776	5635061	SWITCH – VT-110E –
S778	5635061	SWITCH – VT-110E –
S780	5635061	SWITCH – VT-110E –
S781	5635061	SWITCH – VT-110E –
S782	5635061	SWITCH – VT-110E –
S786	5635061	SWITCH – VT-110E –

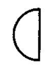
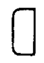
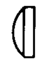
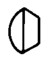
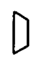
SYMBOL-NO.	P-NO.	DESCRIPTION	SYMBOL-NO.	P-NO.	DESCRIPTION
S787	5635061	SWITCH – VT-110E –	S778	5635111	SMK CONNECTOR (V-10) – VT-120E –
S771	5635111	SMK CONNECTOR (V-10) – VT-120E –	S780	5635111	SMK CONNECTOR (V-10) – VT-120E –
S772	5635111	SMK CONNECTOR (V-10) – VT-120E –	S781	5635111	SMK CONNECTOR (V-10) – VT-120E –
S773	5635111	SMK CONNECTOR (V-10) – VT-120E –	S782	5635111	SMK CONNECTOR (V-10) – VT-120E –
S774	5635111	SMK CONNECTOR (V-10) – VT-120E –	S786	5635111	SMK CONNECTOR (V-10) – VT-120E –
S775	5635111	SMK CONNECTOR (V-10) – VT-120E –	S787	5635111	SMK CONNECTOR (V-10) – VT-120E –
S776	5635111	SMK CONNECTOR (V-10) – VT-120E –	S799	5622801	SWITCH – VT-120E –

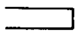
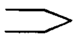
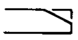
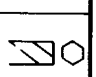
EXPLODED VIEWS

SCREW CLASSIFICATION

Example: BT3 × 6



Abbreviation	Name	Shape
No symbol	Brazier head	
P	Pan head	
B	Binding head	
O	Oval countersunk head	
F	Flat countersunk head	

Abbreviation	Name	Shape
No symbol	Machine (clamps without tapping)	
t	Tapping (clamps with tapping) Type 1	
T	Tapping (clamps with tapping) Type 2	
f	Forming tight (for metal)	

Note Since the forming tight screw tightens while self-tapping, machine screws can be replaced by tapping screws.

Washers and Nuts

Abbreviation	Name	Shape
W SW LW	Washer Spring washer Locking washer	
E	E-ring	
N	Nut	

Note Internal dia is indicated for nuts and washers.

LUBRICATION

Lubrication points are shown in the exploded view diagrams by marks (Ⓢ, Ⓗ)
Lubricants shown in the diagram are as follows.

Ⓢ Sonic slider oil (♯ 1600)
Ⓗ Hitazol (MO-138)

SYMBOL-NO.	P-NO.	DESCRIPTION
RV751	5027225	RESISTOR VARIABLE 10KOHM
RV752	5009131	VARIABLE 500KOHM

SEMI-CONDUCTORS

SYMBOL-NO.	P-NO.	DESCRIPTION
D201	5339071	DIODE 1SS119
D301	5339071	DIODE 1SS119
D303	5339071	DIODE 1SS119
D401	5339091	DIODE DAN209
D402	5339071	DIODE 1SS119
D502	5339071	DIODE 1SS119
D503	5339071	DIODE 1SS119
D504	5339071	DIODE 1SS119
D505	5339071	DIODE 1SS119
D506	5339071	DIODE 1SS119
D507	5339071	DIODE 1SS119
D605	5339071	DIODE 1SS119
D609	5339071	DIODE 1SS119
D610	5339071	DIODE 1SS119
D619	5339071	DIODE 1SS119
D620	5339071	DIODE 1SS119
D622	5339071	DIODE 1SS119
D623	5339071	DIODE 1SS119
D628	5339071	DIODE 1SS119
D629	5339071	DIODE 1SS119
D631	5339071	DIODE 1SS119
D640	5339071	DIODE 1SS119
D645	5339071	DIODE 1SS119
D651	5339071	DIODE 1SS119
D652	5339071	DIODE 1SS119
D653	5339071	DIODE 1SS119
D751	5339021	DIODE 1SS133
D752	5339021	DIODE 1SS133
D753	5339021	DIODE 1SS133
D754	5331592	DIODE 1SS133
D760	5331592	DIODE 1SS133
D764	5381211	LED SEL-2213C
D801	5339071	DIODE 1SS119
D802	5339071	DIODE 1SS119
D803	5339071	DIODE 1SS119
D804	5339071	DIODE 1SS119
D805	5339071	DIODE 1SS119
D806	5339071	DIODE 1SS119
⚠ D851	5332741	DIODE D3SB10
⚠ D852	5331671	DIODE DS135D-FA3
⚠ D853	5331671	DIODE DS135D-FA3
⚠ D854	5331671	DIODE DS135D-FA3
⚠ D855	5331671	DIODE DS135D-FA3
D856	5331671	DIODE DS135D-FA3
D857	5331671	DIODE DS135D-FA3
D861	5331671	DIODE DS135D-FA3
D862	5331671	DIODE DS135D-FA3
D865	5330571	DIODE 1S2473VE SI 100MHZ 250MW 10NS
D903	5339071	DIODE 1SS119
D904	5339071	DIODE 1SS119
D914	5339071	DIODE 1SS119
IC201	5370821	IC HT4495
IC203	5370844	IC HT4727
IC204	5362262	IC MSM6965RS
IC205	5370502	IC HT4408
IC301	5370273	IC HT4539B

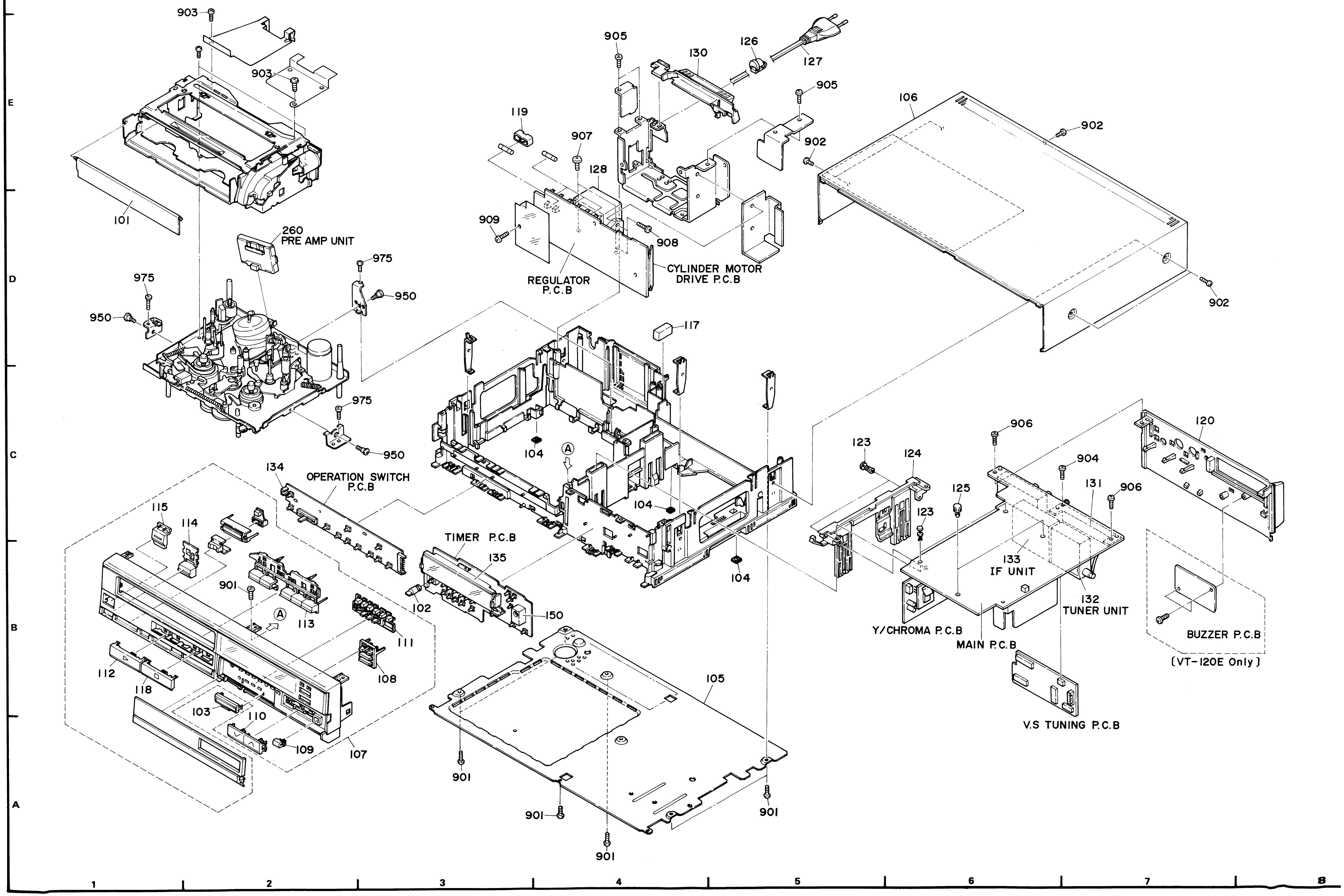
SYMBOL-NO.	P-NO.	DESCRIPTION
IC303	5366641	IC BA7025L
IC401	5366331	IC UPC1533HA
IC402	5364931	IC BA5115L
IC403	5369431	IC LA7016
IC501	5369431	IC LA7016
IC601	5367301	IC M54898P
IC602	5369913	IC M54648L-B
IC751	5361996	IC HD614045SD53
IC801	5361834	IC M50161-354SP
IC802	5366132	IC LA7934
IC803	5361071	IC M58657P
IC804	5721802	ICP-N5 IC PROTECTOR
IC805	5721802	ICP-N5 IC PROTECTOR
IC851	5353651	IC STK5471
IC901	5361812	IC HD614042SD37
IC902	5367111	IC M54649L
IC903	5365673	IC NJM2901N
IC1651	5355582	IC HA13403
Q141	5381681	TRANSISTOR PT-23F-F PHOTO
Q142	5381682	TRANSISTOR PT-23F-HLD PHOTO
Q201	5327062	TRANSISTOR 2SC1740S
Q202	5321255	TRANSISTOR 2SA844CD SILICON 200MHZ 0.3W
Q203	5321292	TRANSISTOR 2SC1740S SILICON 250MHZ 0.3W
Q205	5327062	TRANSISTOR 2SC1740S
Q206	5327062	TRANSISTOR 2SC1740S
Q207	5327062	TRANSISTOR 2SC1740S
Q208	5321255	TRANSISTOR 2SA844CD
Q209	5322732	TRANSISTOR 2SA952ML2 SILICON 160MHZ 0.6W
Q210	5327062	TRANSISTOR 2SC1740S
Q211	5327062	TRANSISTOR 2SC1740S
Q212	5327062	TRANSISTOR 2SC1740S
Q213	5327062	TRANSISTOR 2SC1740S
Q214	5321255	TRANSISTOR 2SA844CD SILICON 200MHZ 0.3W
Q215	5321255	TRANSISTOR 2SA844CD SILICON 200MHZ 0.3W
Q401	5327101	TRANSISTOR 2SC3553BC
Q402	5327031	TRANSISTOR 2SA673C
Q431	5327031	TRANSISTOR 2SA673C
Q502	5327031	TRANSISTOR 2SA673C
Q504	5322732	TRANSISTOR 2SA952ML2 SILICON 160MHZ 0.6W
Q611	5327001	TRANSISTOR 2SC458CD
Q612	5327001	TRANSISTOR 2SC458CD
Q613	5323461	TRANSISTOR 2SD1266PQ
Q614	5327001	TRANSISTOR 2SC458CD
Q615	5327031	TRANSISTOR 2SA673C
Q616	5327001	TRANSISTOR 2SC458CD
Q626	5327001	TRANSISTOR 2SC458CD
Q627	5327001	TRANSISTOR 2SC458CD
Q751	5321663	TRANSISTOR 2SC2021RS SILICON 180MHZ 0.3W
Q754	5321663	TRANSISTOR 2SC2021RS SILICON 180MHZ 0.3W
Q755	5321663	TRANSISTOR 2SC2021RS SILICON 180MHZ 0.3W
Q802	5327011	TRANSISTOR 2SC1740RS
Q803	5327001	TRANSISTOR 2SC458CD

REPLACEMENT PARTS LIST (ERSATZTEILLISTE)

ELECTRICAL PARTS LIST

SYMBOL-NO.	P-NO.	DESCRIPTION
CAPACITORS		
C201	0208374	CERAMIC DISC 0.01μF ±20% 50V
C204	0256608	ELECTROLYTIC 220μF 6.3V
C208	0256613	ELECTROLYTIC 4.7μF 35V
C209	0208375	CERAMIC DISC 0.022μF ±10% 50V
C211	0208357	CERAMIC DISC 56pF ±5% 50V
C214	0208360	CERAMIC DISC 100pF ±5% 50V
C217	0256613	ELECTROLYTIC 4.7μF 35V
C218	0208363	CERAMIC DISC 330 pF ±10% 50V
C222	0208352	CERAMIC DISC 22pF 50V
C223	0208360	CERAMIC DISC 100pF ±5% 50V
C228	0208375	CERAMIC DISC 0.022μF ±10% 50V
C232	0208375	CERAMIC DISC 0.022μF ±10% 50V
C234	0208375	CERAMIC DISC 0.022μF ±10% 50V
C236	0207085	ELECTROLYTIC 47MF, 10V
C240	0208374	CERAMIC DISC 0.01μF ±20% 50V
C241	0249592	CERAMIC DISC 560pF ±10% 50V
C242	0208374	CERAMIC DISC 0.01μF ±20% 50V
C244	0208374	CERAMIC DISC 0.01μF ±20% 50V
C245	0208374	CERAMIC DISC 0.01μF ±20% 50V
C248	0208374	CERAMIC DISC 0.01μF ±20% 50V
C249	0208357	CERAMIC DISC 56pF 50V
C250	0208364	CERAMIC DISC 82pF 50V
C251	0208350	CERAMIC DISC 15pF ±5% 50V
C253	0208356	CERAMIC DISC 47pF 50V
C254	0207064	ELECTROLYTIC 1MF, 50V
C255	0207085	ELECTROLYTIC 47MF, 10V
C256	0208374	CERAMIC DISC 0.01μF ±20% 50V
C301	0208351	CERAMIC DISC 18pF 50V
C309	0208365	CERAMIC DISC 680pF ±10% 50V
C313	0208352	CERAMIC DISC 22pF 50V
C351	0208374	CERAMIC DISC 0.01μF ±20% 50V
C355	0208375	CERAMIC DISC 0.022μF ±10% 50V
C360	0208358	CERAMIC DISC 68pF ±5% 50V
C416	0208367	CERAMIC DISC 1000pF ±10% 50V
C423	0208374	CERAMIC DISC 0.01μF ±20% 50V
C425	0207092	ELECTROLYTIC 100μF 16V
C426	0208374	CERAMIC DISC 0.01μF ±10% 50V
C428	0208365	CERAMIC DISC 680pF ±10% 50V
C502	0208374	CERAMIC DISC 0.01μF ±20% 50V
C506	0208374	CERAMIC DISC 0.01μF ±20% 50V
C508	0208374	CERAMIC DISC 0.01μF ±20% 50V
C510	0208374	CERAMIC DISC 0.01μF ±20% 50V
C512	0208374	CERAMIC DISC 0.01μF ±20% 50V
C513	0256789	CAPACITOR 470μF 10V ELECTROLYTIC
C522	0207086	CAPACITOR 47μF 16V ELECTROLYTIC
C523	0208374	CERAMIC DISC 0.01μF ±20% 50V
C524	0256782	ELECTROLYTIC 220μF 10V
C527	0208374	CERAMIC DISC 0.01μF ±20% 50V
C529	0208374	CERAMIC DISC 0.01μF ±20% 50V
C604	0208374	CERAMIC DISC 0.01μF ±20% 50V
C605	0208375	CERAMIC DISC 0.022μF ±20% 50V
C607	0208368	CERAMIC DISC 1500pF ±20% 50V
C608	0208365	CERAMIC DISC 680pF ±10% 50V
C616	0208367	CERAMIC DISC 1000pF ±10% 50V
C618	0208375	CERAMIC DISC 0.022 μF ±10% 50V
C620	0208375	CERAMIC DISC 0.022μF ±10% 50V
C621	0208374	CERAMIC DISC 0.01μF ±20% 50V
C624	0208374	CERAMIC DISC 0.01μF ±20% 50V
C637	0208375	CERAMIC DISC 0.022μF ±10% 50V
C638	0208374	CERAMIC DISC 0.01μF ±20% 50V
C641	0256475	TANTALUM 4.7μF ±30% 10V
C642	0208374	CERAMIC DISC 0.01μF ±20% 50V
C644	0208367	CERAMIC DISC 1000pF ±10% 50V
C653	0208360	CERAMIC DISC 100pF ±5% 50V
C751	0256488	CAPACITOR 0.1F 5.5V
C770	5058562	TRIMMER 22pF
C801	0208357	CERAMIC DISC 56pF ±5% 50V
C815	0208360	CERAMIC DISC 100pF ±5% 50V
C816	0208354	CERAMIC DISC 33pF ±5% 50V
C817	0208354	CERAMIC DISC 33pF ±5% 50V
C825	0256180	CAPACITOR 1μF 50V ELECTROLYTIC
C854	0256657	ELECTROLYTIC 4700μF 35V
C856	0256635	ELECTROLYTIC 220μF 50V
C860	0256607	ELECTROLYTIC 47μF 25V
C861	0256607	ELECTROLYTIC 47μF 25V
C863	0256627	ELECTROLYTIC 47MF, 16V
C864	0256627	ELECTROLYTIC 47MF, 16V
C865	0256627	ELECTROLYTIC 47MF, 16V
C867	0256627	ELECTROLYTIC 47MF, 16V
C901	0208374	CERAMIC DISC 0.01μF ±20% 50V
C902	0208375	CERAMIC DISC 0.022μF ±20% 50V
C903	0208375	CERAMIC DISC 0.022μF ±20% 50V
C904	0208374	CERAMIC DISC 0.01μF ±20% 50V
C906	0208374	CERAMIC DISC 0.01μF ±20% 50V
C907	0208375	CERAMIC DISC 0.022μF ±20% 50V
C908	0208374	CERAMIC DISC 0.01μF ±20% 50V
C909	0208354	CERAMIC DISC 33pF ±5% 50V
C910	0208354	CERAMIC DISC 33pF ±5% 50V
C912	0208374	CERAMIC DISC 0.01μF ±20% 50V
C913	0208374	CERAMIC DISC 0.01μF ±20% 50V
C1657	0256618	ELECTROLYTIC 22μF 25V
C1658	0256618	ELECTROLYTIC 22μF 25V
C1659	0256618	ELECTROLYTIC 22μF 25V
C1660	0256618	ELECTROLYTIC 22μF 25V
C1661	0256618	ELECTROLYTIC 22μF 25V
C1662	0256618	ELECTROLYTIC 22μF 25V
C1663	0256618	ELECTROLYTIC 22μF 25V
RESISTORS		
R215	0170348	CARBON FILM 470OHM ±5% 1/8W
R305	0171015	METAL FILM 68OHM ±5% 1W
R602	0249681	POSISTOR 4.7OHM
RT201	5007435	RESISTOR SEMI VARIABLE 10KOHM
RT351	5007431	RESISTOR SEMI VARIABLE 470OHM
RT401	5007899	SEMI VARIABLE 47KOHM
RT402	5007901	SEMI VARIABLE 100KOHM
RT501	5009142	RESISTOR VARIABLE 50KOHM
RT601	5007899	SEMI VARIABLE 47KOHM
RT607	5007902	SEMI VARIABLE 220KOHM

CABINET SECTION (GEHÄUSEEINHEIT) – VT-110E –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REGULATOR P.C.B
CYLINDER MOTOR DRIVE P.C.B
101
260 PRE AMP UNIT
975
950
975
950
975
950
117
104
Ⓐ
104
104
134
OPERATION SWITCH P.C.B
115
114
901
Ⓐ
113
111
108
112
118
103
110
109
107
TIMER P.C.B
135
102
150
105
901
901
901
901
123
124
125
123
906
904
131
906
133 IF UNIT
132 TUNER UNIT
Y/CHROMA P.C.B
MAIN P.C.B
V.S TUNING P.C.B
120
BUZZER P.C.B
(VT-120E Only)
A
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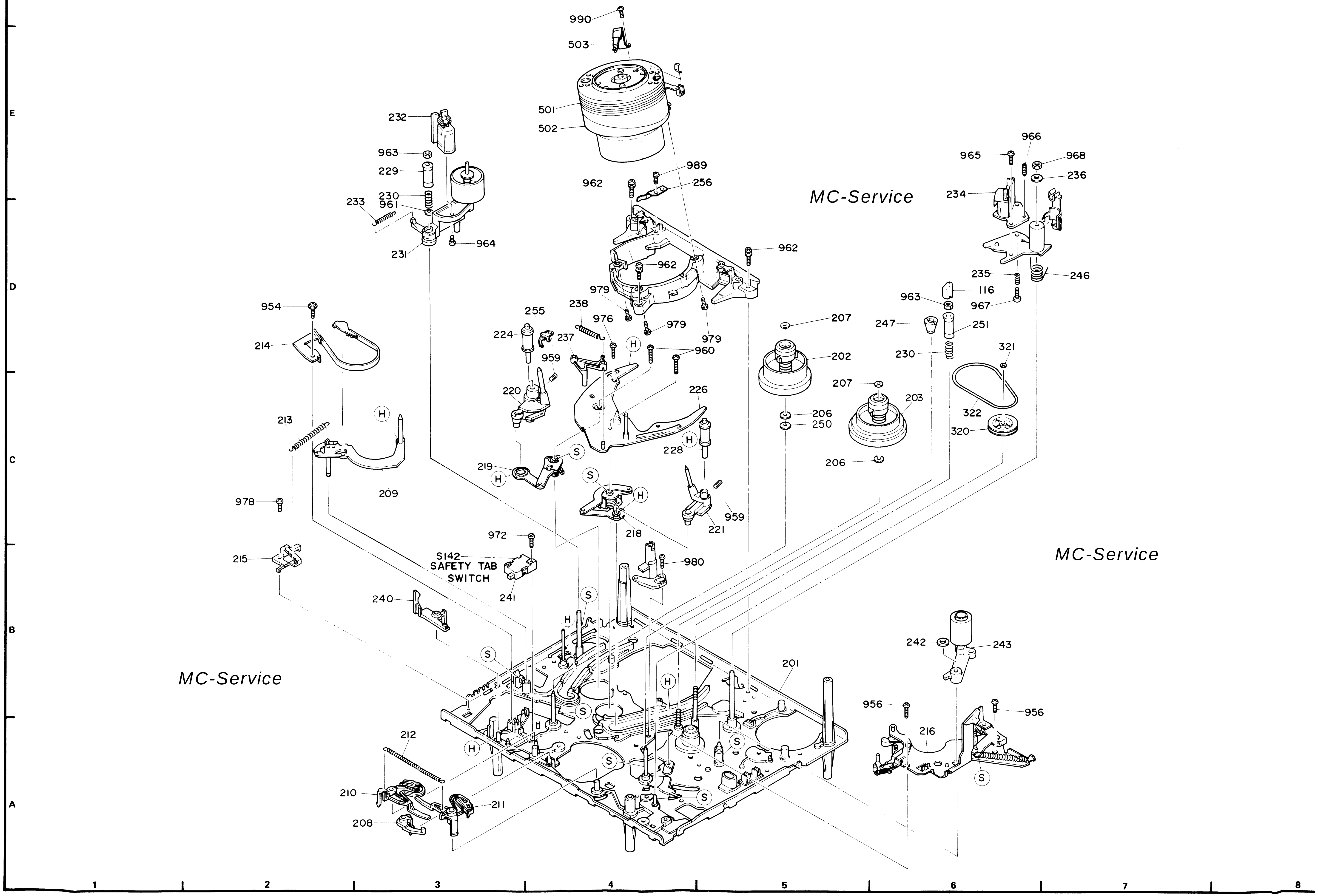
CHASSIS (I) SECTION (CHASSIS [I])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S142
SAFETY TAB
SWITCH
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980
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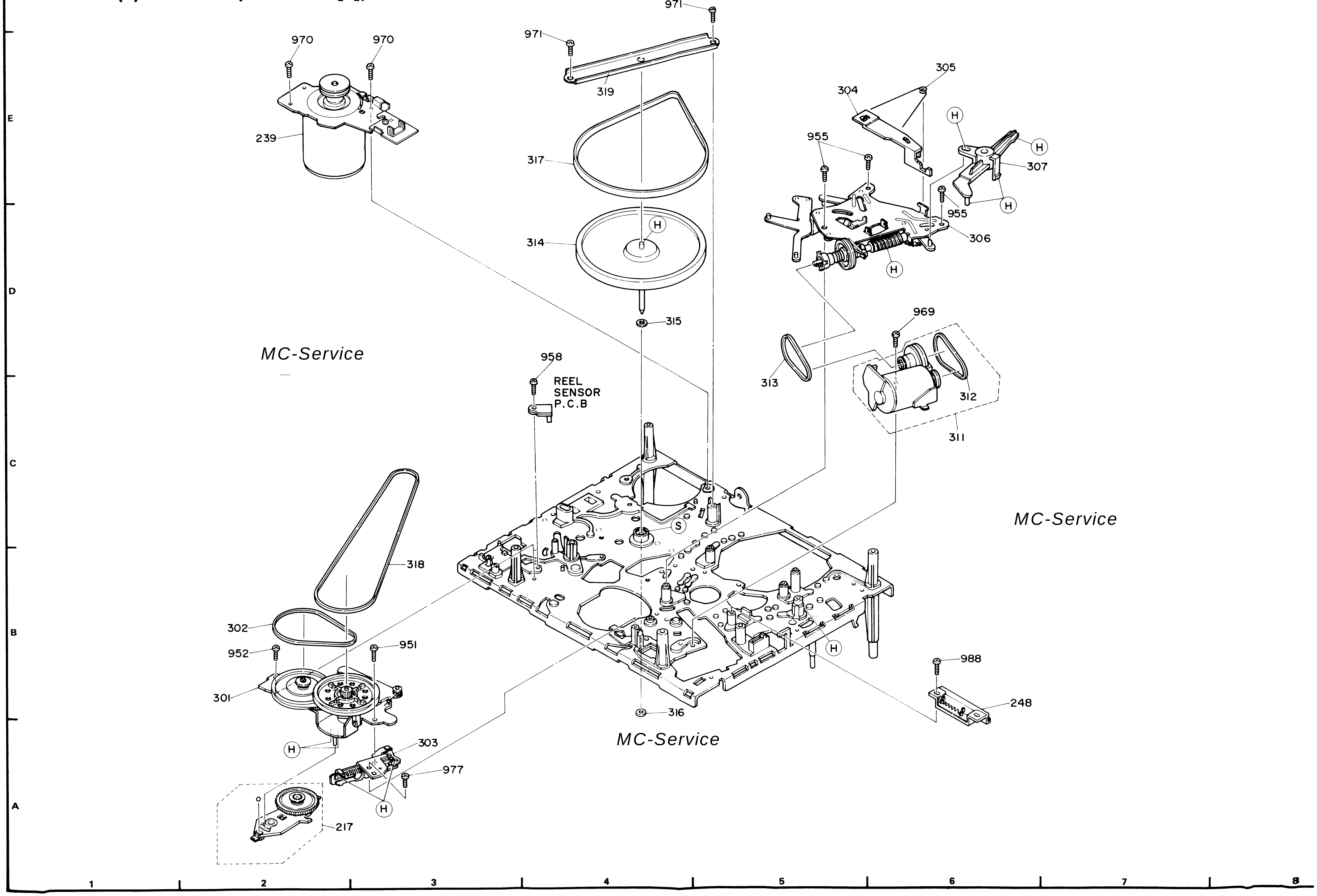
CHASSIS (II) SECTION (CHASSIS [II])



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314
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306
H
D
315
969
958
REEL
SENSOR
P.C.B
313
312
311
C
S
318
H
302
B
952
951
988
301
248
316
H
303
977
A
H
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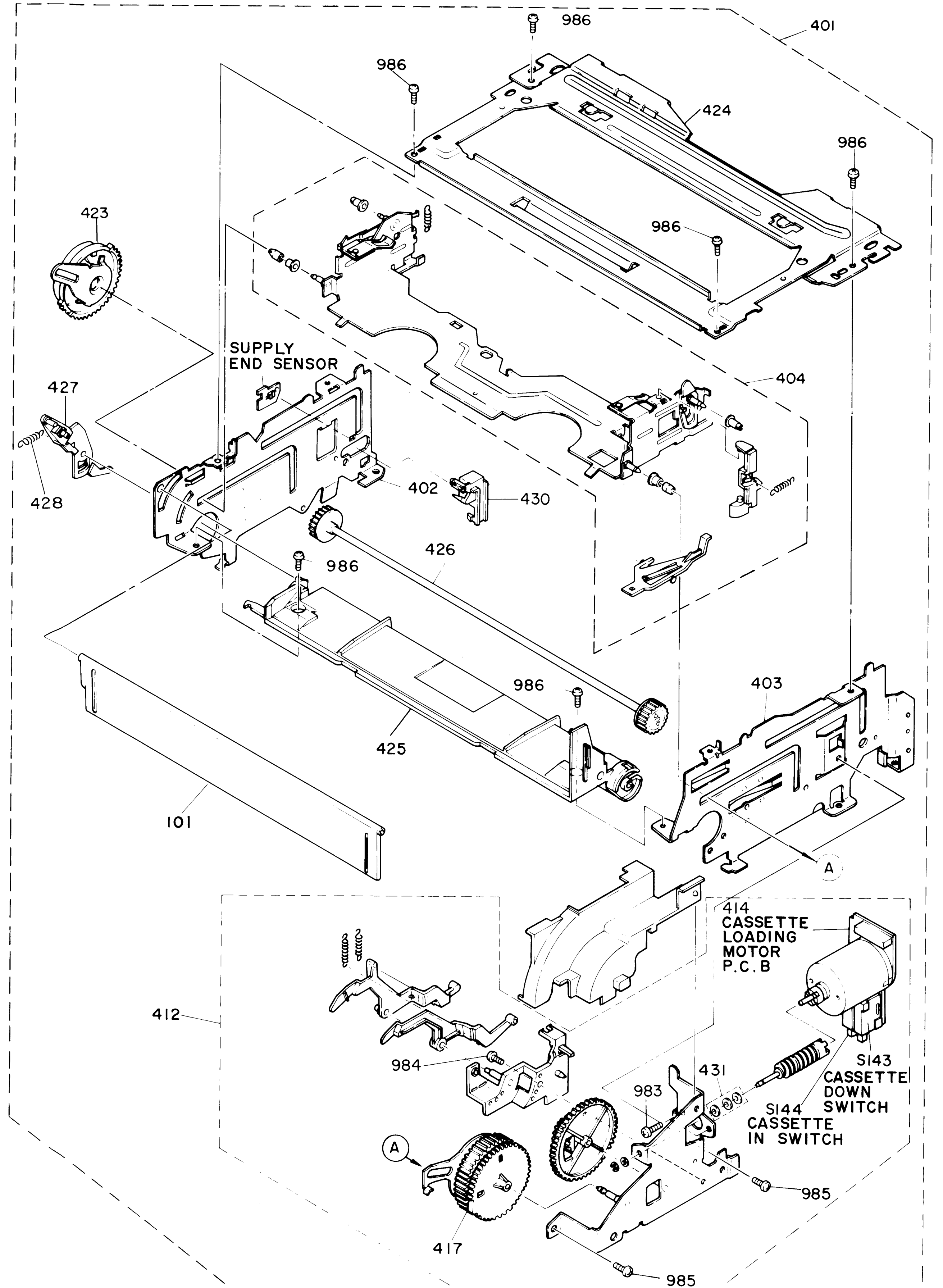
CASSETTE LOADING MECHANISM SECTION (CASSETTEN-LADEMECHANISMUS)



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401
424
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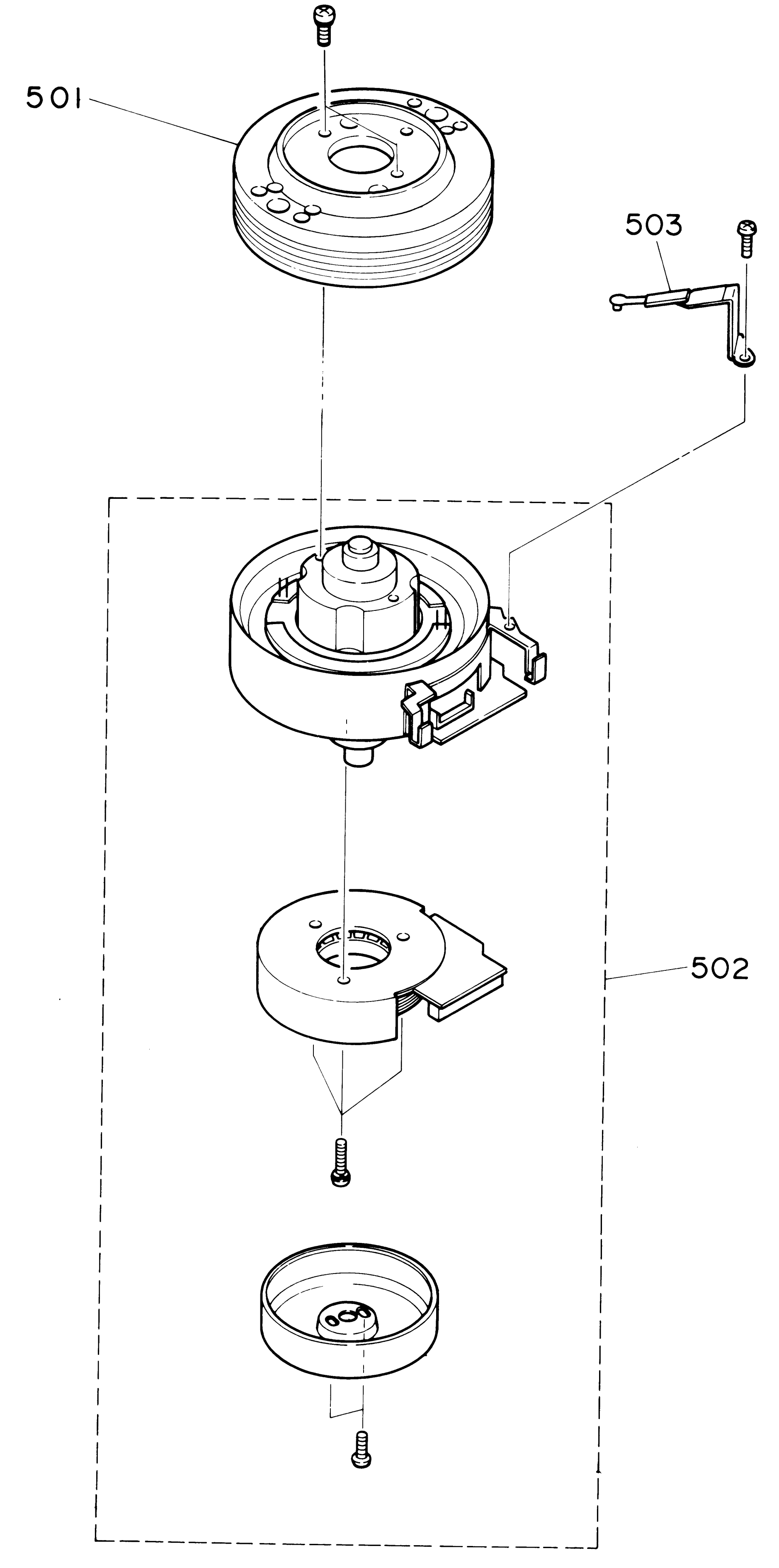
986
423
SUPPLY END SENSOR
404
427
428
402
430
426
986
986
403
425
101
A
414 CASSETTE LOADING MOTOR P.C.B
412
S143 CASSETTE DOWN SWITCH
984
431
983
S144 CASSETTE IN SWITCH
A
985
417
985

CYLINDER MOTOR SECTION (KOPFTROMMELMOTOR)



MECHANICAL PARTS LIST (CHASSIS/CASSETTE LOADING MECHANISM/CYLINDER MOTOR ASSEMBLY SECTION)

SYMBOL-NO	P-NO	DESCRIPTION
		FOR FINAL ASSEMBLY
202	6415391	REEL TABLE-SUPPLY
203	6415412	REEL TABLE-TAKE UP
206	7787412	WASHER
207	7778859	POLYSLIDER WASHER
208	6865662	ARM-BRAKE
209	7386841	TENSION ARM
210	6865804	BRAKE L
211	6865812	BRAKE R
212	6302471	SPRING
213	6543864	SPRING
214	7376271	TENSION BAND
215	6879421	BT.SPRING HOLDER
216	7386882	ARM BRACKET
217	6886792	ARM
218	7376303	LOADING LINK (RIGHT) ASSEMBLY
219	7376313	LOADING LINK (LEFT) ASSEMBLY
220	6978301	GUIDE ROLLER BASE (I)
221	6974661	BASE
224	6869481	GUIDE ROLLER
226	7386892	GUIDE BASE HOLDER
228	6868061	GUIDE ROLLER ASSEMBLY (OUT)
229	7570671	TAPE GUIDE (I)
230	6304903	SPRING
231	6879902	IMPEDANCE ARM ASSEMBLY
232	5446151	FULL ERASE HEAD
233	6302391	SPRING
234	5446161	AUDIO CONTROL HEAD
235	6304906	SPRING
236	7786245	WASHER
237	6878932	SUB BRAKE
238	6300084	SPRING
239	5578761	MOTOR-CAPSTAN
240	6865675	RECORDING PREVENTION ARM
241	5633971	SWITCH (S142)
242	7788143	POLYSLIDER WASHER
243	6979842	PRESSURE ROLLER ASSEMBLY
246	6547811	SPRING
247	6979042	SCREW
248	5625141	SWITCH
250	6873291	COLLAR
251	4504401	TAPE GUIDE
255	6877521	COLLAR
256	6539101	SPRING
260	5372041	PRE AMP PCB ASSEMBLY
301	6886824	CLUCH PLATE ASSEMBLY
302	6355561	BELT
303	7386971	SLIDER-BRAKE
304	6865733	MODE SLIDER
305	6547821	SPRING
306	6889552	GEAR
307	6865791	TENTION ARM
311	7386931	MOTOR(DC) 3.7W 65G LOADING
312	6356111	BELT
313	6356451	BELT
314	6375031	FLYWHEEL
315	7788142	POLYSLIDER WASHER (THRUST)
316	7788861	WASHER
317	6356101	BELT
318	6356081	BELT
319	7386833	PLATE
320	6869291	PULLEY
321	7778859	POLYSLIDER WASHER
322	6355561	BELT
401	7397052	FRONT LOADING ASSEMBLY
402	7386744	BRACKET
403	7386701	BRACKET(R)
404	7386813	HOLDER-CASSETTE
412	7394493	BRACKET-MOTOR
414	5946911	MOTOR CBA
417	6879104	LOADING GEAR ASSEMBLY (R)
423	6879093	LOADING GEAR ASSEMBLY (L)
424	7390551	PLATE
425	6887322	FRONT HOLDER
426	4500402	SHAFT
427	6879153	DOOR ARM
428	6301027	SPRING
430	6879182	GUIDE PIECE
501	5457471	UPPER CYLINDER
502	5457481	LOWER CYLINDER
503	5792631	BRUSH
950	7541395	SPECIAL SCREW
951	8691408	BIND HEAD TAPPING SCREW 3MMD X 8MM
952	8741408	SCREW (B3X8)
954	7781133	BT SCREW 3MMD
955	8691408	BIND HEAD TAPPING SCREW 3MMD X 8MM
956	8691408	BIND HEAD TAPPING SCREW 3MMD X 8MM
958	8691408	BIND HEAD TAPPING SCREW 3MMD X 8MM
959	7773083	SCREW
960	8741408	SCREW (B3X8)
961	8812114	WASHER - 3MMD SMALL
962	8650412	SCREW 3X12 WITH SPRING WASHER
963	8821114	3D NUT
964	8741103	SCREW(2X3B)
965	7781872	SCREW-3MMDX8MM
966	7773086	SCREW
967	8741414	BINDING SCREW - 3MMD X 14MM
968	8821114	3D NUT
969	8741408	SCREW (B3X8)
970	8691408	BIND HEAD TAPPING SCREW 3MMD X 8MM
971	8691408	BIND HEAD TAPPING SCREW 3MMD X 8MM
972	8691312	BT BIND SCREW-2.6MMDX12MM
975	8699410	BT BIND HEAD SCREW 3MMD X 14MM BLACK
976	7782781	SCREW 3X8BT

SYMBOL-NO	P-NO	DESCRIPTION
977	8691408	BIND HEAD TAPPING SCREW 3MMD X 8MM
978	8741408	SCREW (B3X8)
979	8650408	SCREW
980	8741406	BIND SCREW - 3MMD X 6MM
983	8741403	BIND SCREW-3MMDX3MM
985	8671406	DT SCREW-3MMDX6MM
986	8678405	DT SCREW-3MMDX5MM (BLACK)
988	8691410	SCREW
989	8711103	PAN HEAD SCREW 2X3
990	8741406	BIND SCREW - 3MMD X 6MM